Families with Children with Autism, Developmental Delay, and Typical Development: The Relationships of Parenting Self-Efficacy, Parenting Strategies, and Child Problem Behaviour

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Submitted in partial fulfillment

of the requirements for the degree of

Master of Arts

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Abstract

Parents of children with autism spectrum disorders (ASD) and developmental delays (DD) may experience more child problem behaviours, report lower parenting self-efficacy (PSE), and be more reactive than proactive in their parenting strategies than those who have children with typical development (TD). Differences in PSE and parenting strategies may also influence the extent to which child problem behaviours are experienced by parents who have children with ASD and DD, compared to those who have children with TD. Using a convenience sample of parents of children with ASD (n = 48), DD (n = 51), and TD (n = 72), this study examined group differences on three key variables: PSE, parenting strategies, and child problem behaviour. Results indicated that those in the DD group scored lower on PSE in preventing child problem behaviour than the ASD group. The TD group used fewer reactive strategies than the DD group, and fewer proactive strategies than both the ASD and DD groups. For the overall sample, higher reactive strategies use was found to predict higher ratings of child problem behaviour, while a greater proportion of proactive to reactive strategies use predicted lower ratings of child problem behaviour. PSE was found to moderate DD diagnosis and child problem behaviour. Implications for a behavioural (i.e., parenting strategies) or cognitive (i.e., PSE) approach to parenting are discussed.

Acknowledgements

Thank you to my supervisor and mentor, Dr. Maurice Feldman, without whom this thesis would not have been possible. I am grateful for your guidance and hope that the final product fairly represents what I have learned from you. To my committee members, Dr. Rebecca Ward and Dr. Rosemary Condillac, and external examiner, Dr. Christine Tardif-Williams, thank you for your support and enthusiasm for this study. Your kindness, patience, and expertise are very much admired and appreciated. I would like to acknowledge the community agencies and service providers who took the time to make this study known to families. Finally, I am extremely thankful to all the families who volunteered their time to participate in this study. Your generosity and insights were truly vital to this project.

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Introduction

Child problem behaviours faced by parents of children who have autism spectrum disorders (ASD) and developmental delays (DD) are unique and elevated compared to those who have children with typical development (TD; Baker, Blacher, Crnick, & Edelbrock, 2002; Merrell & Holland, 1997; Osborne, McHugh, Saunders, & Reed, 2008). Correspondingly, parents of children with ASD and DD are more likely to suffer higher degrees of stress and depression and lower levels of parenting self-efficacy (PSE), compared to parents of children with TD (Cameron, Snowdon, & Orr, 1992; Feldman, Hancock, Reilly, Minnes, & Cairns, 2000). Some evidence suggests that parents of children with behaviour problems and disabilities may be prone to using reactive parenting strategies (Gardner, Sonuga-Barke, & Sayal, 1999; Tucker & Fox, 1995). Using a convenience sample of families who have children with ASD, DD, and TD, this study compared parent-reported child problem behaviours, the strategies that parents use to address these problem behaviours, and parents' self-ratings of their effectiveness in managing child problem behaviour. As well, relationships between PSE, parenting strategies use, and child problem behaviour were examined using regression models. The intent was to examine if PSE would mediate the relationship between parenting strategies use and child problem behaviour, or if parenting strategies use would mediate the relationship between PSE and child problem behaviour. Additionally, PSE and parenting strategies use were examined separately as potential moderators of the relationship between diagnosis (i.e., ASD, DD, or TD) and child problem behaviour.

Previous researchers have found possible mediation and moderation effects (Baron & Kenny, 1986) between child problem behaviour, parenting strategies, and PSE,

for families who have children with and without disabilities (Coleman & Karraker, 1997; Hastings & Brown, 2002). Results of this study contribute to this evidence base by further comparing and exploring the interactions between these three variables specific to families with children who have ASD, DD, or TD. This study could help inform clinical decision-making in addressing the unique challenges faced by parents of children with ASD and DD compared to parents of children with TD.

The following literature review will provide a summary of the current status of research on child problem behaviour, PSE, and parenting strategies. Next, these variables will be discussed specific to families who have children with ASD and DD. Theoretical and clinical implications of this study will be highlighted.

Child Problem Behaviour

Child problem behaviours include those that may hinder child learning, increase social stigma, influence parental mental health, and impact overall family quality of life. Child problem behaviours may include aggression, destructive behaviour, self-injury, crying, screaming, defiance, or behaviours that potentially pose a safety risk to the child (e.g., noncompliance during daily routines, bolting, pica, stripping, rumination, tantrums). Research has suggested that many of these problem behaviours may be more prevalent in males, individuals with intellectual disabilities, and those with a lack of communication skills, including autism (Emerson et al., 2001; Holden & Gitlesen, 2005).

Not surprisingly, parents of children with behaviour problems are more likely to be stressed (Floyd & Gallagher, 1997), depressed (Ashman, Dawson, & Panagiotides, 2008; Feldman et al., 2007; Giles, Davies, Whitrow, Warin, & Moore, 2011), and less

likely to be confident about their parenting abilities (Feldman & Werner, 2002; Meunier et al., 2011; Porter & Hsu, 2003).

Parenting Self-Efficacy

According to Bandura (1982), perceptions of self-efficacy are "concerned with judgments of how well one can execute courses of action required to deal with prospective situations" (p.122). Extending this definition to parenting practices, parenting self-efficacy (PSE) can be conceptualized as the extent to which parents perceive themselves to be capable of effectively addressing their children's needs. For the present study, parents' perceptions of self-efficacy were specific to the management of child problem behaviours (i.e., general feelings of effectiveness, effectiveness in stopping and preventing child problem behaviour, and effectiveness in teaching their child a better way of behaving).

Previous research has demonstrated that PSE may mediate the relationship between child problem behaviour and maternal depression, for both TD and ASD populations (Cutrona & Troutman, 1986; Hastings & Brown, 2002). Using Baron and Kenny's (1986) definition of mediation, this means that any significant relationship between child problem behaviour and maternal depression is explained by parenting self-efficacy. In other words, child problem behaviour would only be a significant predictor of maternal depression if PSE was not considered in the analysis. The relationship between child problem behaviour and maternal depression, in effect, depends on the mediation of PSE.

In a study of parents of children with TD, Johnston and Mash (1989) reported inverse relationships between parent-reported child behaviour problems and parenting

satisfaction (for mothers), and between child behaviour problems and parenting satisfaction and self-efficacy (for fathers). That is, for parents of children who were typically developing, higher levels of child problem behaviour were related to lower levels of parenting satisfaction and self-perceived competence.

Mothers of 2- to 8-year-old children with conduct problems have also been shown to rate themselves lower on measures of self-efficacy relevant to daily parenting tasks than mothers whose children do not have conduct problems (Sanders & Woolley, 2005). Using the General Self-Efficacy scale (GSE; Jerusalem & Schwarzer, 1992) and the Parenting Scale (Arnold et al., 1993) to measure PSE and parental discipline strategies, the researchers found that low maternal ratings of PSE significantly predicted self-reported lax (permissive and inconsistent parenting) and overreactive (harsh) parenting practices, after parent, child, contextual, and sociodemographic variables were accounted for.

While there is evidence that PSE is correlated with parenting and child problem behaviour, it may be important to consider PSE in the context of other variables. For example, some evidence suggests that, for parents of typically developing children, PSE may also be predicted by feelings of general self-efficacy (i.e., not solely related to parenting ability), marital satisfaction, and overall family functioning (Sevigny & Loutzenhiser, 2009). PSE may also be better examined in a context specific to parenting and managing child problem behaviours. Previous research has demonstrated that PSE may vary depending on specific aspects of parenting, such as stopping child problem behaviour, preventing child problem behaviour, and teaching better ways of behaving (Feldman & Werner, 2002).

Parenting Strategies

Some research has suggested that parenting competence may be more strongly related to child behaviour than to PSE (Coleman & Karraker, 2003). This is consistent with research that has demonstrated that negative parenting practices (i.e., lack of responsiveness, coercive, hostile, rejecting, or controlling parenting) are related to increased child behaviour problems (Pierce et al., 2010). However, research has also shown that lower maternal PSE is related to such negative parenting practices (Pierce et al., 2010). Thus far, research has not yet clearly demonstrated whether specific measures of parenting strategies (i.e., proactive, reactive) or PSE (i.e., general, stopping, preventing, teaching) better predict child problem behaviour.

It may make sense to examine parenting and child problem behaviour by parsing caregiving strategies into proactive and reactive categories. Proactive parenting strategies are categorized as pre-emptive or preventative strategies implemented before the occurrence of problem behaviour (e.g., praise for appropriate behaviour, modeling, teaching). These include antecedent and reinforcement-based parenting strategies to promote appropriate behaviour and to prevent problem behaviour from occurring. Reactive parenting strategies involve responding after the problem behaviour has already occurred (e.g., reprimands, time out, distraction).

Baumrind's (1971) authoritarian and authoritative parenting styles and their attributes can be classified as predominantly proactive or reactive. While authoritarian parenting attempts to "shape, control, and evaluate the behaviour and attitudes of the child in accordance with an [absolute] standard of conduct," (p.22), authoritative parenting "does not hem the child in with restrictions," (p.22) and "sets standards for

future conduct" (p.22). Authoritarian parenting involves inflexibility, consequence and punishment based parenting strategies use, and can be characterized as predominantly reactive. Authoritative parenting, on the other hand, involves flexible parenting, reasoning, teaching, and can be characterized as both proactive and reactive (e.g., highly demanding and highly responsive). Authoritative parenting has been shown to be superior to other parenting styles for rearing children well into young adulthood (Baumrind, 1991). Evidence for the success of authoritative parenting suggests that parenting that involves reactive methods is not synonymous with bad parenting overall. It is likely that most parents use a combination of both proactive and reactive parenting methods (Gardner et al., 1999).

Gardner et al. (1999) studied 52 mothers of toddlers with or without behaviour problems and found that there were no differences in the use of positive parenting strategies between groups. In this study, positive parenting included the use of reasoning, compromises, incentives, and imaginative strategies. However, the mothers of toddlers who had behaviour problems were less likely to use pre-emptive strategies and more likely to use reactive strategies (i.e., "those introduced only after the child has misbehaved," p.1187). Similarly, Clunies-Ross, Little, and Kienhuis (2008) found that teachers who used more reactive strategies in the classroom were more likely to experience stress and less on-task student behaviour.

In a longitudinal study of 42 parents of preschoolers with and without externalizing behaviour problems, Stormont (2001) found that the children whose behaviour problems persisted over the 5-year course of the study had mothers who tended to use more controlling child-rearing practices and aggressive tactics during conflicts

compared to parents whose children had improved or who had no behaviour problems. Such tactics are comparable to the use of harsh and reactive parenting practices after child problem behaviour has already occurred, as opposed to the use of prevention and reinforcement-based strategies prior to the occurrence of problem behaviour. These findings are concerning because research has demonstrated that negative maternal control in toddlerhood may be predictive of behaviour problems in children well into later childhood (Campbell & Erwing, 1990).

Several studies have demonstrated the positive effects of proactive strategies on child problem behaviour. Gardner et al. (2007) found that positive and proactive strategies were associated with a reduced risk of conduct problems in preschoolers. Holden (1983) and Holden et al. (1989) demonstrated that mothers who used more preventive strategies had children who exhibited fewer problem behaviours and violated fewer rules in a supermarket setting. The mothers were also more likely to engage their children in acceptable behaviour for longer periods of time. Note that these were correlational studies, and thus, did not demonstrate directions of causality.

Outcomes of behavioural parent training programs emphasizing the use of proactive strategies, such as the Webster-Stratton and Triple P programs, have been shown to be promising for parents of children with TD (Patterson, Mockford, & Stewart-Brown, 2005; Sanders, 1999; Webster-Stratton, Hollinsworth, & Kolpacoff, 1989). Patterson et al. (2005) found that participants who received behavioural parent training were more confident and reported improvements in their children's behaviour as a result of training. Positive behaviour supports have been shown to be effective for oppositional, aggressive, and antisocial behaviour (Kazdin, 1997). A substantial evidence base

supports the effectiveness of using positive strategies on a school-wide basis (Lewis & Sugai, 1999; Luiselli, Putnam, Handler, & Feinberg, 2005). Thus, the benefits of using proactive strategies have been well documented.

Cognitive vs. Behavioural Interpretations of Parenting

Bandura (1982) proposed that "self-percepts of efficacy influence thought patterns, actions, and emotional arousal" (p.122). Within a social cognitive framework, actions (including parenting strategies used to manage child problem behaviour) and emotions (such as parental stress and depression) are in part caused by perceptions of self-efficacy. Under this paradigm, parenting behaviours and their influence on child problem behaviour would be largely explained by how confident the parent feels. A mediation effect of PSE between parenting strategies and child problem behaviour would support this theory. Likewise, a moderation effect of PSE on diagnosis and child problem behaviour may also support a social-cognitive perspective.

Skinner's (1974) radical behaviourist theory stands in stark contrast to Bandura's (1982) concept of self-efficacy. According to Skinner (1974), feelings such as confidence or self-efficacy are merely by-products of operant behaviours governed by environmental variables (i.e., contingencies of reinforcement and punishment). The likelihood for the use of any parenting strategies would depend on the consequences that they have produced in the past (i.e., their impacts on child problem behaviour). This is similar to Patterson's (2002) coercive family processes in which difficult behaviour in early childhood is often reinforced by incompetent parenting, which in turn, evoke increased child behaviour problems. Such an interaction could be characterized as a reciprocal arrangement of negative reinforcement contingencies for both the parent and

child, resulting in increased hostility and challenging behaviour, respectively, over time. From a behavioural perspective, any relationship found between PSE and child problem behaviour would actually be explained by parenting behaviours (i.e., what the parent does). A mediation effect of parenting strategies between PSE and child problem behaviour would support the behavioural stance. A moderation effect of parenting strategies on diagnosis and child problem behaviour may also provide evidence for this theory.

While behavioural and cognitive theories have garnered supporters and critics in the field of psychology as a whole, neither of these theories have been examined specifically in the area of parenting children with and without ASD and DD. Evidence in support of either theory would have important implications for developing interventions geared towards parents of children with behaviour problems, including children with and without ASD and DD.

Children with DD

A developmental delay occurs when a young child does not reach developmental milestones at the same time as age-matched peers (Centre for Disease Control and Prevention, 2011a). The prevalence of developmental delays in children has been reported to range from 5.6% to 17.1% (Rosenberg, Zhang, & Robinson, 2008), with an average around the 10% mark (Hartley, Salt, Dorling, & Gringras, 2002). About 50% of children with severe developmental disabilities have been found to also have an organic condition, such as Down Syndrome and Fragile X Syndrome (Hartley et al., 2002). Children with DD visit the doctor more often, require emergency care more often, miss more days at school, and are more likely to repeat a grade in school compared to children

without DD (Boyle, Decoufle, & Yeargin-Allsopp, 1994). Understandably, raising a child with DD presents a unique set of challenges to parents. Therefore, further analysis of parent-child variables is necessary in order to effectively develop and deliver proper support to affected families.

Child Problem Behaviour

Children who have DD experience greater social challenges and problem behaviour than typically developing children (Baker et al., 2002; Feldman et al., 2000; Merrell & Holland, 1997; Paczkowski & Baker, 2007; Richman, Stevenson, & Graham, 1982). Children with DD are more likely to experience deficits in social interaction and independence skills, exhibit problem behaviour excesses, and socially withdrawn and isolated behaviour patterns (Merrell & Holland, 1997). Preschoolers with DD are more likely to play alone and less likely to smile or laugh with their peers (Kopp, Baker, & Brown, 1992). Not surprisingly, many parents raising young children with developmental delay report experiencing heightened levels of stress and depression (Baker et al., 2002; Cameron, Snowdon, & Orr, 1992; Feldman et al., 2007). For families with children with DD, child behaviour problems have also been found to be strongly correlated with parental depression, stress, and marital adjustment (Baker, Blacher, & Olsson, 2005; Feldman et al., 2007; Wieland & Baker, 2010).

Parenting Self-Efficacy

Feldman et al. (2007) have found an inverse relationship between depression and PSE in caregivers of children with or at risk for developmental delays. Further, they found that PSE mediated the relationship between depression and child problem behaviour when social support was excluded from the analysis. Taken together, the

mental health impacts of child problem behaviour may be exacerbated for parents of children with DD who lack social support. The evidence also suggests that parents who are more depressed may also be more likely to experience lower levels of confidence about their parenting ability.

In a study of parents of children with developmental disabilities, Woolfson, Taylor, and Mooney (2010) examined parent's perceptions of child controllability (i.e., the extent to which a parent feels their child's behaviour is controllable). They found that perceptions of child controllability moderated the relationship between developmental disability and child problem behaviour. Thus, there is evidence to suggest that parental perceptions of how manageable their child's behaviour is can have real impacts on the actual levels of child problem behaviours seen.

Parenting Strategies

For families who have children with DD, research has demonstrated that the relationship between child behaviour problems and parental stress may be mediated by the use of effective coping strategies (i.e., planful problem solving), whereas an elevated risk may be linked to the use of ineffective (i.e., escape-avoidance) strategies (Frey, Greenberg, & Fewell, 1989). Planful problem solving, or proactive parenting, appears to predict decreased parental stress, whereas escape-avoidance, or reactive parenting, appears to increase the risk for parental stress.

Other researchers have shown that reactive parenting strategies use is related to increased child problem behaviour for children with mild disabilities. Tucker and Fox (1995) demonstrated that parents of preschoolers with mild handicaps were more likely to

use reactive parental discipline (e.g., "I yell at my child for spilling food") when their ratings of child externalizing behaviour were high.

Woolfson and Grant (2006) examined the relationship between parental stress and the use of authoritative parenting approaches in parents of children with and without DD. The authors described authoritative parenting as "parental control within an ethos of warm, responsive parenting that explains reasons, values the child as an individual and aims to encourage the child towards independence" (Woolfson & Grant, 2006, p.178). Such an approach utilizes both proactive and reactive strategies, with an emphasis on prevention and pre-emptive problem-solving. Woolfson and Grant (2006) found that parents of young children with DD were more likely to use authoritative parenting than parents of older children with DD. Interestingly, the opposite was demonstrated by their comparison group of parents with typically developing children. That is, with an increase in child age, parents of typically developing children were more likely to use authoritative parenting approaches. The authors concluded that the decrease in authoritative parenting approaches used by parents of children with DD over time may be partly explained by the stress they experience and the level of effort required to implement authoritative parenting practices as their children grew older. Supporting this finding, other researchers have found that stress appears to increase with age in families with children who have disabilities (Gallagher, Beckman, & Cross, 1983).

Children with ASD

Autism spectrum disorders are a group of disorders characterized by significant challenges in socialization, communication, and repetitive or stereotyped patterns of behaviour (American Psychiatric Association, 2000). Designations are classified by

impairments that range from mild (Asperger Syndrome, high-functioning autism, pervasive developmental disorder – not otherwise specified) to severe (autistic disorder). The estimated prevalence rate of ASDs ranges from 0.42% to 1.25%, with an average of 0.91% (Centre for Disease Control and Prevention, 2011b). ASDs are sometimes associated with other organic conditions (e.g., Rett Syndrome, mitochondrial dysfunction), but the causes of autism remain unknown. It is likely that ASD arises from a combination of genetic susceptibilities and environmental factors (Currenti, 2009).

Child Problem Behaviour

Studies have shown that children with ASD are at a heightened risk for problem behaviours, including self-injury, stereotypic behaviours, aggression, destructive behaviour, and feeding problems (Rojahn, Matson, Lott, Esbensen, & Smalls, 2001; Schreck, Williams, & Smith, 2004). As research comparing ASD populations to DD and TD populations are scarce in the area of child problem behaviours, more studies need to be conducted to explore these relationships.

Estes et al. (2009) compared families who have children with ASD and DD on measures of parenting stress, psychological distress, and child problem behaviour. They found that child problem behaviour was positively related to parenting stress and psychological distress for both groups. Mothers of children with ASD were also found to experience higher levels of stress and psychological distress than those in the DD group. Further analyses are required to better understand the relationship between child problem behaviour and parenting for families who have children with ASD and DD.

Parenting Self-Efficacy

In a study of 46 parents of children with ASD, Hastings & Brown (2002) found that PSE mediated the effect of child problem behaviour on maternal anxiety and depression, whereas PSE had a moderating effect on the relationship between child behaviour problems and anxiety for fathers. In light of these findings, the authors concluded that "interventions that act to increase feelings of self-efficacy in parents of children with autism would ... have positive effects on both fathers' and mothers' mental health" (Hastings & Brown, 2002, p.229). However, because the findings were correlational and comparisons between the effects of parenting strategies use and PSE on child problem behaviour have not been well documented for the ASD population, it remains unclear where the emphasis should lie when it comes to intervention.

Parenting Strategies

Planful problem solving may be characterized as an antecedent-based, proactive parenting strategy with an emphasis on prevention, whereas escape-avoidance strategies can be categorized as reactionary to child problem behaviour (Frey, Greenberg, & Fewell, 1989). Parents' use of limit-setting, involving a combination of proactive and reactive strategies, has been demonstrated to mediate the relationship between parenting stress and child problem behaviours for families with children with ASD (Osborne et al., 2008). However, parenting behaviours between those who have children with ASD and those who have children with TD may not be significantly different. Some researchers have found that general parenting behaviours were comparable between those who had children with and without ASD (Lambrechts, Van Leeuwen, Boonen, Maes, & Noens,

2011). At present, differences in parenting strategies use between ASD, DD, and TD populations remain under-researched.

While it is generally acknowledged that children with ASD experience challenges that significantly impact on the family unit, much of the autism literature has focused on child-centred interventions rather than on family-oriented approaches (Osborne et al., 2008). It can be speculated that research directions have predominantly focused on the individual with autism, rather than other important contextual variables (i.e., parenting and PSE). However, mediator models of intervention and parent training approaches have been shown to be promising for families with children with ASD (Feldman, Condillac, Tough, Hunt, & Griffiths, 2002; Schultz, Schmidt, & Stichter, 2011). Further investigation of parent-child variables in families with children with ASD may reveal their unique needs that are distinct from those experienced by families with children who have DD or TD.

Research Gaps

There is substantial evidence that families with children who have ASD and DD are at an increased risk for parental distress (Feldman et al., 2007), decreased parenting self-efficacy (Hastings & Brown, 2002), and face more frequent (Baker et al., 2002) and prolonged (Campbell & Erwing, 1990) child problem behaviour than children with TD. Children with ASD and DD are more likely to exhibit problem behaviour, and thus, their parents may be more likely to use reactive, ineffective, or harsh parenting practices (Stormont, 2001) and less likely to use proactive and positive approaches than typically developing children (Woolfson & Grant, 2006).

Thus far, the role of PSE has not been adequately examined between ASD, DD, and TD populations. While there is some research on the role of PSE in relation to parental mental health and child problem behaviour (Cutrona & Troutman, 1986; Feldman et al., 2007; Hastings & Brown, 2002; Johnston & Mash, 1989), little research examines the role of PSE in relation to parenting strategies (Sanders & Woolley, 2005), and none compare PSE, child problem behaviour, and parenting strategies across ASD, DD, and TD populations.

Further investigation in this area is warranted, particularly since findings may bear significance for case planning and the development of effective supports for parents of children with ASD or DD. Evidence for mediation effects between child problem behaviour, PSE, and parenting strategies may help practitioners determine the areas in which interventions should focus (i.e., improving parenting self-efficacy versus educating parents about proactive and positive strategies). Parent training programs have been shown to improve child problem behaviour and PSE for parents of children with autism (Singh et al., 2006) and DD (Feldman & Werner, 2002). However, the mechanisms responsible for these effects of parent training (i.e., cognitive, behavioural, or both) remain largely unexplored.

In their seminal paper, Baron and Kenny (1987) exemplified mediation by using the S-O-R model, "which recognizes that an active organism intervenes between stimulus and response" (p. 1176). This study aims to test an analogous model specific to parenting. If PSE is shown as a significant mediator between parenting strategies and child problem behaviour, a cognitive perspective on parenting will be supported. Alternatively, if parenting strategies are shown to mediate the relationship between PSE

and child problem behaviour, a behavioural approach to parenting can be supported. Evidence for moderation effects, in which the strength of a relationship between two variables (e.g., PSE and child problem behaviour) is influenced by the level of an intervening variable (e.g., parenting strategies), could also support a cognitive or behavioural view.

Hypotheses

Between Group Hypotheses

1. Parents of children with ASD will report more child behaviour problems, use more reactive strategies, fewer proactive strategies, and have lower parenting self-efficacy than parents of children with DD and parents of TD children.
2. Parents of children with DD will report more child behaviour problems, use more reactive strategies, fewer proactive strategies, and have lower parenting self-efficacy than parents of TD children.

Relationships Between Key Variables

3. Parenting strategies and parenting self-efficacy will be significant predictors of child problem behaviour.

Four additional hypotheses will also be tested to determine whether a cognitive (PSE focus) or behavioural (parenting strategies focus) best explains the relationship between parenting strategies, parenting self-efficacy, and child problem behaviour:

4. The relationship between parenting strategies and child problem behaviour will be mediated by parenting self-efficacy (i.e., cognitive interpretation of parenting).
5. The relationship between parenting self-efficacy and child problem behaviour will be mediated by parenting strategies (i.e., behavioural interpretation of parenting).

6. The relationship between ASD, DD, or TD diagnosis and child problem behaviour will be moderated by parenting self-efficacy (i.e., cognitive interpretation of parenting).
7. The relationship between ASD, DD, or TD diagnosis and child problem behaviour will be moderated by parenting strategies (i.e., behavioural interpretation of parenting).

Method

Recruitment

Participants were parents of children between the ages of 2 and 7 years old whose children either: (1) had a diagnosis of an ASD, (2) were at risk for or had a developmental delay, or (3) were typically developing. Parents spoke or had a working understanding of English in order to complete the questionnaires required for the study.

Data for the DD group were drawn from the existing Child Care Vision (CCV) database (Feldman et al., 2000; Feldman et al., 2007). These participants were recruited using an ecologically valid "social systems epidemiological approach" (Kiely & Lubin, 1983). Participants were children who received or were eligible for early intervention or other specialized services for children with or at risk for DD. Children were diagnosed with Global Developmental Delay or had known biological conditions associated with risk for DD (e.g., Down syndrome, cerebral palsy, spina bifida).

With the exception of the use of internet list services, recruitment of TD and ASD children was similar to that used in CCV. Data for TD and ASD children were previously collected by student researchers since 2006 (with the exception of 3 ASD participants who were from the CCV database).

For the purposes of this thesis, more parents of TD children (n = 16) and children with ASD (n = 26) were recruited to increase the sample size to allow for multiple regression analyses. Recruitment took place by word-of-mouth and via listings on organizational websites' research lists (e.g., Autism Ontario). Service agencies, private practitioners, parent advocacy groups, and other individuals and organizations that may have had connections with our target population were contacted with information about the study (Appendix C). The resulting sample was a snowballing convenience sample.

Setting

Interested individuals initiated contact by phone or e-mail in response to the advertisements for the study. The questionnaires were sent to participants via e-mail or postal mail, and any questions and concerns were addressed by e-mail or phone. The questionnaires were completed by the participants in any environment of their choosing (i.e., likely at home). Participants had the option of returning the questionnaires by e-mail or postal mail.

Participants

Demographic information for the current sample can be found in Table 1. The sample consisted of families who had children with ASD (n = 48), DD (n = 51), and TD (n = 72); 157 mothers and 13 fathers completed the measures. Most families who participated in this study were two-parent, middle-income families.

Table 1. Family Demographics for Each Diagnostic Group

Variable	ASD (n = 48)	DD (n = 51)	TD (n = 72)
% mother informants	95.83%	94.12%	87.50%
% father informants	4.17%	5.88%	11.11%
Mean mother age in years (*SD*)	36.41 (4.47)	36.16 (6.67)	33.79 (4.79)
Mean father age in years (*SD*)	38.85 (6.28)	37.62 (6.37)	37.19 (6.43)
Mean number children living at home (*SD*)	2.00 (.80)	2.25 (.94)	2.01 (.93)
Mean number of adults living at home (*SD*)	2.08 (.45)	2.00 (.53)	2.07 (.57)
% rural households	10.42%	3.92%	26.76%
% urban households	87.50%	96.08%	71.83%
Mean mother years in school (*SD*)	16.47 (2.50)	14.51 (2.20)	17.40 (4.02)
Mean father years in school (*SD*)	16.05 (3.99)	14.32 (3.72)	15.68 (3.74)
% mothers employed	56.25%	58.82%	76.39%
% fathers employed	75.00%	76.47%	73.61%
% two-parent families	89.56%	84.31%	94.44%
Mean range of family income	$75K-80K	$50K-55K	$80K-85K

Data on child characteristics can be found in Table 2. Overall, 70% (n = 120) of the children were male, and 30% (n = 51) were female. Six percent (n = 10) of the overall sample were twins. Almost all of the children were the biological offspring of the informants.

Table 2. Child Characteristics for Each Diagnostic Group

Variable	ASD (n = 48)	DD (n = 51)	TD (n = 72)
Mean age (months) (*SD*)	62.26 (17.47)	52.88 (18.90)	50.85 (20.78)
% males	68.75%	70.59%	70.83%
% females	31.25%	29.41%	29.12%
% twins	10.42%	5.88%	2.78%
% natural child	100.00%	92.16%	98.61%
% premature	8.33%	56.86%	19.44%
% moderate to severe delay	45.83%	50.98%	0%

Data was collected on diagnostic subtypes for ASD and DD groups (Table 3 and 4, respectively). Of the ASD sample, 13% were diagnosed with PDD-NOS, 6% with Autistic Disorder, 6% with multiple diagnoses, 4% with Asperger Syndrome, and 4% with HFA. A large proportion (42%) was identified as having an ASD diagnosis (subtype not specified).

Table 3. Diagnostic Subtypes in ASD Group (n = 48)

Diagnosis	Frequency (Percent)
Autistic Disorder	3 (6.25%)
PDD-NOS	6 (12.50%)
Asperger Syndrome	2 (4.17%)
High Functioning Autism (HFA)	2 (4.17%)
Multiple Diagnoses	3 (6.25%)
ASD (subtype not specified)	20 (41.67%)

Of the DD sample, 51% had an unspecified diagnosis or were identified at risk, 20% had multiple diagnoses, 10% were diagnosed with Down Syndrome, and the remaining 19% were diagnosed with various conditions (i.e., learning disability, cerebral palsy, spina bifida, brain damage, other organic/genetic).

Table 4. Diagnostic Subtypes in DD Group (n = 51)

Diagnosis	Frequency (Percent)
Learning Disability	2 (3.92%)
Down Syndrome	5 (9.80%)
Cerebral Palsy	3 (5.88%)
Spina Bifida	2 (3.92%)
Brain Damage	1 (1.96%)
Other Organic/Genetic	2 (3.92%)
Multiple Diagnoses	10 (19.61%)
Unspecified/At Risk	26 (51.00%)

Measures

Family Information Questionnaire (FIQ). The Family Information Questionnaire (FIQ; Appendix A) is a demographics questionnaire consisting of 56 questions about child variables (e.g., age, sex, diagnosis, overall health), family variables (e.g., income, parent education, parent occupation, family composition), and birth history (e.g., length of pregnancy, complications during pregnancy or birth). The FIQ was locally-developed and has been used in previous research (Feldman et al., 2000).

Child Behaviour Management Survey (CBMS). The Child Behaviour Management Survey (CBMS; Appendix B) was used to measure child problem behaviour, PSE, and parenting strategies. The CBMS was locally-developed and has been previously used in research with parents of children with DD and behaviour disorders (Feldman et al., 2000; Feldman & Werner, 2002). It has also been used with

demonstrated reliability with children with or at risk for developmental delay (Rielly, 1998).

Child problem behaviour rating scale. Using a Likert-type scale (1 = never, 2 = rarely, 3 = occasionally, 4 = sometimes, 5 = usually, 6 = frequently, 7 = always), parents were asked to rate whether they thought each of 42 child behaviours was currently a problem. Using the data from the current study, internal consistency was found to be excellent across these items (α = .94). Number of problem behaviours entailed a frequency count of behaviours that were rated as $\geq$5. Mean ratings across each of the 42 behaviours was also calculated.

Parenting self-efficacy. Parents were asked to describe their child's worst problem behaviour and how they typically handled this problem. As a measure of PSE, they were asked to rate on a Likert-type scale (1 = not effective, 3 = moderately effective, 7 = very effective) in: (1) how effective their approach is in general, (2) how effective their approach is in stopping the problem behaviour when it occurs, (3) how effective their approach is in preventing the problem behaviour from occurring again, and (4) how effective their approach is in teaching the child a better way of behaving. Cronbach's alpha was good across these measures of PSE (α = .82).

The four CBMS PSE rating scales (general, stopping, preventing, teaching) for the child's most difficult behaviour were evaluated separately, as previous studies show differential effects depending on what aspect of self-reported effectiveness in handling behaviour problems is queried (Feldman & Werner, 2002). Additionally, a PSE composite score was calculated by taking the mean of all the PSE ratings (general, stopping, preventing, teaching). In contrast to the PSE general score, the PSE composite

variable was created as an overall PSE score that also tapped into the different measures of PSE.

Parenting strategies. The CBMS Supplemental Checklist on Management Strategies was used to measure proactive and reactive strategies that parents reported using. On a 7-point Likert-type scale (1 = never, 4 = sometimes, 7 = usually), participants were asked to rate the frequency at which they used the 12 listed strategies (4 proactive strategies and 8 reactive strategies presented randomly) in managing their child's problem behaviour. Proactive items involved asking the parents how often they used: positive verbal for appropriate behaviour, positive physical and tangibles for appropriate behaviour, proactive and preventative strategies, and modeling or teaching appropriate behaviour. Reactive items asked parents how often they used: physical or mechanical restraint, nothing/ignore, time-out, response cost, positive physical and tangibles for inappropriate behaviour, negative verbal, distraction or change location, and corporal punishment. Internal consistency for proactive items was good ($\alpha = .81$). Readers are cautioned that internal consistency was found to be poor for reactive items ($\alpha = .46$).

To compare proactive and reactive strategy use across diagnostic groups, a proportion of proactive to reactive mean ratings was created for each parent (mean reactive rating divided by the sum of mean reactive and proactive ratings). A higher score indicated the preference for proactive strategies whereas a lower score indicated a preference for reactive strategies. This variable was created independent of mean proactive and reactive ratings because it is likely that most parents use a combination of proactive and reactive strategies. While a mean rating indicates the frequency of

proactive or reactive parenting strategies use (i.e., how often parenting strategies are used), a proportion reveals a parent's tendency to use proactive strategies relative to reactive strategies (i.e., a preference for proactive strategies over reactive strategies, regardless of frequency).

Procedure

The FIQ and CBMS were sent along with a consent letter to interested parents by either by e-mail or postal mail, depending on their expressed preference. Completed questionnaires were returned to the researchers via e-mail or postal mail. The questionnaires were expected to take 1 hour to complete.

Ethical Considerations

Each participant was given a consent letter (Appendix D) outlining the purpose, procedures, and possible risks of the study. Participation in this study by completing and returning the questionnaires was indication of consent. Participation was expected to pose only a minimal risk. Participants did not receive any compensation for taking part in the study, which took about 1 hour of their time. The researchers' contact information was made readily available to the participants in case they had any questions or concerns about the study.

Confidentiality of personal information was protected. Raw data was stored in a locked cabinet at the Centre for Applied Disability Studies at Brock University. Each participant was assigned a code before their personal information was entered into the database on SPSS (i.e., their data were not linked to their names).

Upon completion of the study, participants will be sent a summary of the results. The researchers' contact information will be provided with the summary so that

participants may have the opportunity to have their questions answered and concerns addressed.

Data Screening

Procedures for data screening and normalization were derived from Tabachnick and Fidell (1989; 2006). First, the accuracy of data input was screened. Second, missing values were imputed. Third, sample distributions for PSE (general, stopping, preventing, teaching), parenting strategies (i.e., proactive-reactive proportion), and child problem behaviour (number of, mean rating) were evaluated for normality. Transformations were applied in order to normalize the distributions. The data were screened for multicolinearity and singularity. Finally, a power analysis was performed *a priori* to ensure that a sufficient sample size was obtained for the regression analyses. These procedures are described in greater detail in the following sections.

Screening for Accuracy of Data. First, the accuracy of data input was screened. This was done by identifying and correcting out of range values that were impossible or were not likely to have been accurate (e.g., a score that was not one of the available options). Data entry errors were corrected by referring back to the raw data or were excluded from the analysis and treated as missing data. Out of range values were identified during data entry, by visual scan of each relevant variable as they were entered on the spreadsheet, and by inspecting the descriptive statistics for each relevant variable (i.e., verifying that plausible means and standard deviations were achieved).

Missing Values. Less than 6% of the data were missing for each variable overall (M = 3%, range = 0% to 6%). For each missing value, a random number table was used to generate a score within the range obtained from the entire sample for that variable

(Tabachnick & Fidell, 2006). Differences in means and standard deviations before and after missing values were imputed were minimal. In the final dataset, each key variable had a sample size of $n = 171$.

Evaluating Distributions. Prior to any data transformations, histograms and probability plots were produced to evaluate normality for mean child problem behaviour ratings, number of child problem behaviours, parenting strategies (i.e., mean reactive rating, mean proactive rating, proactive-reactive proportion), and parenting self-efficacy (i.e., general, stopping, preventing, teaching, composite score).

Transformations. Skewness and kurtosis values were calculated for all key variables. Acceptable skewness and kurtosis values were defined as those that fell between ±1. Skewness and kurtosis values fell within this range for PSE (i.e., general, stopping, composite) and parenting strategies variables (i.e., mean proactive rating, mean reactive rating, proactive-reactive proportion). Thus, these variables did not require transformation. Although the kurtosis value for PSE (preventing) was 1.04 (i.e., above 1), the variable was not transformed because the skewness was acceptable and kurtosis did approach the ±1 criterion. Further, the kurtosis value divided by the standard error yielded a value less than ±3, and therefore, met an alternative criterion for acceptable kurtosis (Tabachnick & Fidell, 1989).

For distributions that differed from normal, a systematic approach was used to transform the variable. According to Tabachnick and Fidell (2006), a square root transformation should be applied first. Therefore, a square root transformation was applied to number of child problem behaviours and PSE (teaching), resulting in acceptable skewness and kurtosis values. For distributions that differ substantially from

normal, a log transformation is to be used next (Tabachnick & Fidell, 2006). A log transformation was applied to mean child problem behaviours, which corrected skewness and kurtosis values. Descriptive data for the key variables used in the final analyses can be found in Table 5. Histograms for these variables are in Appendix E.

Table 5. Descriptive Statistics for Key Variables Across All Groups (n = 171)

Variable	*M*	*SD*	Skewness	Kurtosis
PSE (general)	4.60	1.66	-.34	-.67
PSE (stopping)	4.39	1.76	-.23	-.85
PSE (preventing)	3.38	1.85	.32	-1.04
PSE (teaching)*	4.03	1.89	-.48*	-.87*
PSE (composite)	4.10	1.45	-.47	-.74
CPB (number)*	4.70	5.98	.48*	-.70*
CPB (mean rating)*	2.21	.87	.27*	-.61*
Proactive (mean rating)	5.24	1.31	-.57	-.07
Reactive (mean rating)	3.08	.78	.10	.54
Proactive-Reactive Proportion	.63	.08	-.45	.89

Note. An asterisk (*) denotes a transformed variable. *M* and *SD* values were those from raw distributions.

Outliers. To utilize all of the available data and to preserve the integrity of the dataset, a decision was made to include all potential outliers. Visual inspection of the raw distributions did not reveal any extreme cases. If the distributions had failed to approach acceptable skewness following data transformation, systematic removal of outliers would have been considered.

Multicolinearity and Singularity. A correlation matrix was used to check for multicolinearity (i.e., highly correlated variables as evidenced by $r > .70$) or singularity (i.e., redundancy as evidenced by perfect or near-perfect correlation) between predictor variables that were to be used for the regression analyses. For moderation tests, predictor variables were centered to reduced colinearity (Aiken & West, 1991). Results indicated that these key variables were not correlated at $r > .70$, and therefore, passed the multicolinearity and singularity test.

Power Analysis. An *a priori* power analysis was performed to determine an adequate sample size for the regression analyses (Tabachnick & Fidell, 2006). Using conventional values for effect size (.15), statistical power level (.8), and probability level (.05), with 3 predictors in the regression model, a minimum sample size of $n = 76$ was required. The final sample size in the study was $n = 171$.

Data Analysis

Hypothesis 1. Parents of children with ASD will report more child behaviour problems, use more reactive strategies, fewer proactive strategies, and have lower parenting self-efficacy than parents of children with DD and parents of TD children.

Hypothesis 2. Parents of children with DD will report more child behaviour problems, use more reactive strategies, fewer proactive strategies, and have lower parenting self-efficacy than parents of TD children.

Both Hypotheses were tested using one-way ANOVAs, with two-tailed Bonferroni-corrected pairwise comparisons, to evaluate group differences in child behaviour problems, parenting strategies use and PSE. For child behaviour, mean ratings and number of behaviour problems (a score ≥ 5) on the CBMS child problem behaviour rating scale were compared across groups. PSE was compared using mean general, stopping, preventing, teaching, and composite scores. Parenting strategies variables used were mean proactive ratings, mean reactive ratings, and the proactive to reactive proportion. After group differences were found for child problem behaviour, ANCOVA was used to evaluate group differences on PSE and parenting strategies, using child problem behaviour (mean rating) as a covariate to control for between group differences on this variable.

Hypothesis 3. Parenting strategies and parenting self-efficacy will be significant predictors of child problem behaviour.

Hypothesis 3 was tested using simple linear regressions for each of PSE (composite) and parenting strategies (i.e., proactive-reactive proportion), with child problem behaviour mean ratings serving as the dependent measure. This procedure was used to test if PSE and/or parenting strategies use would be significant predictors of child problem behaviour.

Hypothesis 4. The relationship between parenting strategies and child problem behaviour will be mediated by parenting self-efficacy (i.e., cognitive interpretation of parenting).

Hypothesis 5. The relationship between parenting self-efficacy and child problem behaviour will be mediated by parenting strategies (i.e., behavioural interpretation of parenting).

Because correlations were not found between all the three key variables (i.e., PSE, parenting strategies, and child problem behaviour), mediation effects (Hypotheses 4 and 5) could not be tested using a multiple regression model (Baron & Kenny, 1986).

Hypothesis 6. The relationship between ASD, DD, or TD diagnosis and child problem behaviour will be moderated by parenting self-efficacy (i.e., cognitive interpretation of parenting).

Moderation effects of PSE (Hypothesis 6) were tested using a hierarchical multiple regression, with child problem behaviour mean ratings serving as the dependent measure. Hierarchical multiple regression was used to control the order of variable entry in each step of the regression model. For each diagnostic group, a dummy variable was entered first (i.e., ASD or not ASD; DD or not DD; TD or not TD). Next, PSE (composite) was entered. Finally, a product variable (i.e., dummy variable multiplied by PSE) was entered to test for any significant interactions between diagnosis and PSE. Each predictor variable was mean-centered to reduce multicolinearity (i.e., redundancy in the equation, as evidenced by high correlation between the predictor variables; Aiken & West, 1991).

Hypothesis 7. The relationship between ASD, DD, or TD diagnosis and child problem behaviour will be moderated by parenting strategies (i.e., behavioural interpretation of parenting).

A similar procedure was used to test for moderation effects of parenting strategies (Hypothesis 7). A hierarchical regression was used with child problem behaviour mean ratings as the dependent variable. For each diagnostic group, a dummy variable was entered first. Next, parenting strategies (i.e., proactive-reactive proportion) was entered. A product variable (i.e., dummy variable multiplied by parenting strategies) was entered at the last step to test for any significant interactions between diagnosis and parenting strategies. As with the test for Hypothesis 6, each predictor variable was mean-centered to reduce multicolinearity (Aiken & West, 1991).

Results

Demographic Variables

Significance tests for differences in demographics and child characteristics between groups can be found in Table 6. Using chi-square tests and ANOVA with pair-wise comparisons, no statistically significant group differences, $p > .05$, were found on the informant's relationship to the child, father's employment status, father's age, number of children living in the home, number of adults living in the home, father's education, parents' special education experience, child's sex, and child's twin status.

Some differences in family demographics reached statistical significance. Children in the ASD group were significantly older than those in the TD group. Correspondingly, mothers in the ASD group were significantly older than those in the TD group. A greater number of TD participants lived in rural areas than both ASD and DD groups. Parents in the TD group were more likely to be married or living together compared to the ASD and DD groups. Mothers in the TD group were also more likely to be employed than those in the ASD and DD groups. The DD group had mothers who

spent a fewer number of years in school and had a significantly lower family income than TD and ASD groups. Children in the DD group were more likely to be born premature. Children in the DD and ASD groups were more likely to have a diagnosed developmental delay than the TD group.

Table 6. Between Group Differences on Demographics and Child Characteristics

Variable	Sig. (*p*)
Mother's age	.012*
Father's age	.50
Number of children living at home	.259
Number of adults living at home	.687
Location of home (rural or urban)	.006*
Mother's education (years in school)	.000*
Father's education (years in school)	.073
Mother's employment status	.007*
Father's employment status	.151
Parents' marital status	.004*
Family income	.000*
Child age	.006*
Child sex	.968
Child's twin status	.292
Child born premature	.000*
Child's level of delay	.000*

Ruling out demographic differences. A number of procedures were performed to rule out demographic differences as explanations for differences in seen in key variables (i.e., PSE, parenting strategies, and problem behaviour) across the diagnostic groups. Demographic differences that reached statistical significance were first tested for correlations with each measure of the key variables (i.e., PSE stopping, preventing, teaching, composite, proactive and reactive parenting strategies use, parenting strategies proportion, number of child problem behaviours, and child problem behaviour mean ratings). Demographic variables that were correlated with the key variables were then tested using ANCOVA, with the demographic variable serving as the covariate. This was done to explore whether main effects of diagnosis (i.e., group differences) could be due to demographic differences. Most demographic variables were ruled out because they did not serve as significant covariates (Appendix F). However, some demographic variables (i.e., location of the home, child was born premature, parents' marital status, family income) served as significant covariates where group differences were seen in the key variables. Location of the home (i.e., rural or urban) and whether the child was born premature were significant covariates to group differences in proactive strategies use. The TD group was more likely to live in rural locations than the ASD and DD groups. Children in the DD group were more likely to be born premature than those in the ASD and TD groups. As well, the parents' marital status and family income co-varied with group differences in mean ratings of child problem behaviour. Parents in the TD group were more likely to be married or living together than those in the ASD and DD groups. Families who had children with DD had lower family income than those in the ASD and TD groups. Readers are alerted to consider these variables when interpreting the between

group results on these two key variables (i.e., proactive parenting strategies use, mean child problem behaviour). Demographic differences did not account for any group differences on any of the other key variables.

Between Group Hypotheses

Hypotheses 1 and 2 were tested using one-way ANOVAs, with two-tailed Bonferroni-corrected pairwise comparisons to evaluate group differences in child problem behaviours. Child problem behaviours were found to be significantly different across the diagnostic groups. Thus, between group comparisons on PSE and parenting strategies were evaluated using ANCOVA, with child problem behaviour as a covariate.

Child Problem Behaviour. Child problem behaviours were compared using number of child problem behaviours (rated ≥ 5 on a 7-point Likert scale) and mean child problem behaviour ratings across the 42 listed problem behaviours on the CBMS.

The main effect of groups using mean ratings of child problem behaviour was significant, $F(2, 168) = 43.85, p < .001$. The main effect of groups as measured by the number of reported child problem behaviours was also found to be significant, $F(2, 168) = 53.45, p < .001$.

Hypothesis 1 (that parents of children with ASD experience more child problem behaviours than parents of children with DD and TD) was partially supported, using pairwise comparisons. Parents of children with ASD had higher behaviour ratings ($M = 2.75$, $SD = .84$) than those in the TD group ($M = 1.66$, $SD = .45$). Parents in the ASD group ($M = 8.19$, $SD = 7.10$) also reported a greater number of problem behaviours than those in the TD group ($M = 1.28$, $SD = 2.50$). These comparisons did not reach significance between ASD and DD groups.

Hypothesis 2 (that parents of children with DD experience more child problem behaviours than parents of children with TD) was supported. Parents of children with DD reported higher mean ratings of child problem behaviour ($M = 2.46$, $SD = .90$) than those in the TD group ($M = 1.66$, $SD = .45$). Parents in the DD group also reported a greater number of child problem behaviours ($M = 6.25$, $SD = 5.85$) than parents of children with TD ($M = 1.28$, $SD = 2.50$).

Parenting Self-Efficacy. The four CBMS PSE rating scales (general, stopping, preventing, teaching) and a PSE composite score (i.e., mean of PSE general, stopping, preventing, and teaching scores) were each compared across diagnostic groups. Because ASD, DD, and TD groups were demonstrated to differ on child problem behaviour, ANCOVA was performed to evaluate group differences on measures of PSE, using mean child problem behaviour as a covariate. This was done to more accurately examine group differences on PSE by taking group differences in child problem behaviour into account.

The predicted main effect of PSE (preventing) was significant, $F(2, 168) = 4.42$, $p < .05$, while child problem behaviour (mean rating) was not, $F(2, 168) = .61$, $p > .05$. The main effect of PSE (composite) was also found to be significant, $F(2, 168) = 3.60$, $p < .05$, and child problem behaviour (mean rating) was not, $F(2, 168) = .11$, $p > .05$. PSE general, stopping and teaching were not significantly different between groups.

Pairwise comparisons revealed that Hypothesis 1 (that parents of children with ASD would have lower PSE than both the DD and TD groups) was not supported across all PSE measures (all p's $> .05$). Interestingly, parents in the ASD group reported higher PSE ratings on preventing child problem behaviour ($M = 3.75$, $SD = 1.93$) than those in the DD group ($M = 2.75$, $SD = 1.82$), $p < .05$. Hypothesis 2 (that parents of children with

DD would have lower PSE than parents of TD children) was not supported. While between subject effects of PSE composite was significant, $p < .05$, following Bonferroni-corrected pairwise comparisons, significant differences were no longer found between DD ($M = 3.63$, $SD = 1.54$) and TD ($M = 4.34$, $SD = 1.30$) groups, $p = .059$.

Parenting Strategies. Three variables were used to measure proactive and reactive parenting strategies across diagnostic groups: mean proactive ratings, mean reactive ratings, and a proactive to reactive parenting strategies proportion. ANCOVA was performed to evaluate group differences on measures of parenting strategies, using mean child problem behaviour as a covariate. This was to take into consideration demonstrated group differences on child problem behaviour.

The main effect of proactive strategies use was found to be significant, $F(2, 168) = 4.98$, $p < .01$, and child problem behaviour was not, $F(2, 168) = .06$, $p > .05$. The main effect of reactive strategies use was found to be significant, $F(2, 168) = 7.61$, $p = .001$, but this co-varied with child problem behaviour mean ratings, $F(2, 168) = 12.18$, $p = .001$. The main effect of the proactive to reactive strategies proportion was significant, $F(2, 168) = 5.74$, $p < .01$, but this co-varied with child problem behaviour mean ratings, $F(2, 168) = 10.43$, $p = .001$.

Hypothesis 1 (that parents of children with ASD use more reactive strategies and fewer proactive strategies than DD and TD groups) was not supported. In fact, the ASD group was found to use more proactive strategies ($M = 5.58$, $SD = 1.07$) than the TD group ($M = 4.83$, $SD = 1.41$), $p < .05$. As well, parents in the ASD group reported using fewer reactive strategies ($M = 2.98$, $SD = .70$) than the DD group ($M = 3.46$, $SD = .78$), $p = .01$, and a greater proportion of proactive to reactive strategies ($M = .64$, $SD = .07$) than

the DD group ($M = .61$, $SD = .07$), $p < .05$, and the TD group ($M = .62$, $SD = .08$), $p = .05$.

Hypothesis 2 (that parents of children with DD would report using more reactive strategies and fewer proactive strategies than the TD group) was partially supported. Parents in the DD group reported using more reactive strategies ($M = 3.46$, $SD = .78$) than the TD group ($M = 2.88$, $SD = .75$), $p < .05$. Parents in the DD group also reported using more proactive strategies ($M = 5.50$, $SD = 1.22$) than the TD group ($M = 4.83$, $SD = 1.41$), $p < .05$.

Relationship Between Key Variables

Predictors of Child Problem Behaviour. Simple linear regressions were used to determine if PSE (composite score) or parenting strategies use (i.e., proactive-reactive proportion) would be significant predictors of child problem behaviour (Hypothesis 3). Results can be found in Tables 7 and 8.

Table 7. Simple Regression (PSE Composite)

Variable	B	SE(B)	β	T	Sig. (p)
PSE (Composite)	-.026	.02	-.10	-1.303	.194

Note. DV = child problem behaviour mean ratings

Table 8. Simple Regression (Parenting Strategies Proportion)

Variable	B	SE(B)	β	T	Sig. (p)
P/R Proportion	-.906	.372	-.184	-2.434	.016*

Note. * $p < .05$. DV = child problem behaviour mean ratings.

While the proactive-reactive proportion was found to be a significant predictor of mean child problem behaviour, $p < .05$, PSE (composite) was not.

A scatterplot of child problem behaviour and parenting strategies use can be found in Figure 1. A negative relationship between these variables is shown (i.e., higher proportions of proactive to reactive parenting strategies use predicted lower mean child problem behaviour ratings).

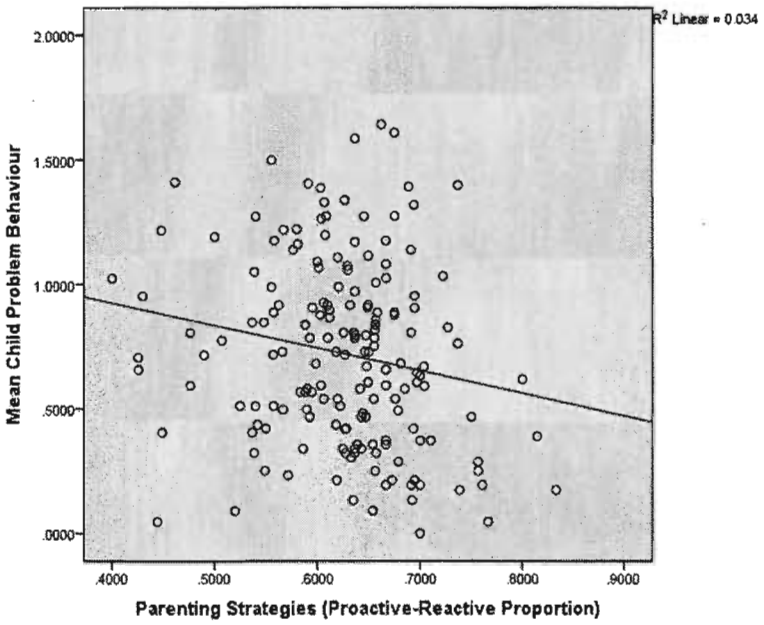

Figure 1. Scatterplot of mean child problem behaviour and parenting strategies use (proactive-reactive proportion). $R^2 = .034$.

To examine if child problem behaviour could be predicted by specific measures of PSE (i.e., general, stopping, preventing, teaching) or parenting strategies (i.e.., proactive rating, reactive rating), a simple regression analysis was performed for each of these variables. Results are presented in Tables 9 (PSE) and 10 (parenting strategies).

Table 9. Simple Regression (Specific PSE Measures)

Variable	B	SE(B)	β	*T*	Sig. (*p*)
PSE (General)	-.01	.017	-.043	-.556	.579
PSE (Stopping)	-.005	.016	-.024	-.308	.758
PSE (Preventing)	-.02	.015	-.101	-1.32	.189
PSE (Teaching)	-.105	.055	-.146	-1.923	.056

Note. DV = child problem behaviour mean ratings.

None of the PSE measures were significant predictors of child problem behaviour. However, PSE (teaching) approached significance ($p = .056$).

Table 10. Simple Regression (Proactive and Reactive Strategies)

Variable	B	SE(B)	β	*T*	Sig. (*p*)
Proactive Rating	.033	.022	.117	1.528	.128
Reactive Rating	.149	.035	.315	4.315	.000***

Note. DV = child problem behaviour mean ratings. *** $p < .001$.

Results revealed that proactive parenting strategies use did not significantly predict child problem behaviour. However, reactive parenting strategies use did ($p < .001$).

Figure 2 depicts a scatterplot of this positive relationship (i.e., higher reactive strategies use predicted higher mean ratings of child problem behaviour).

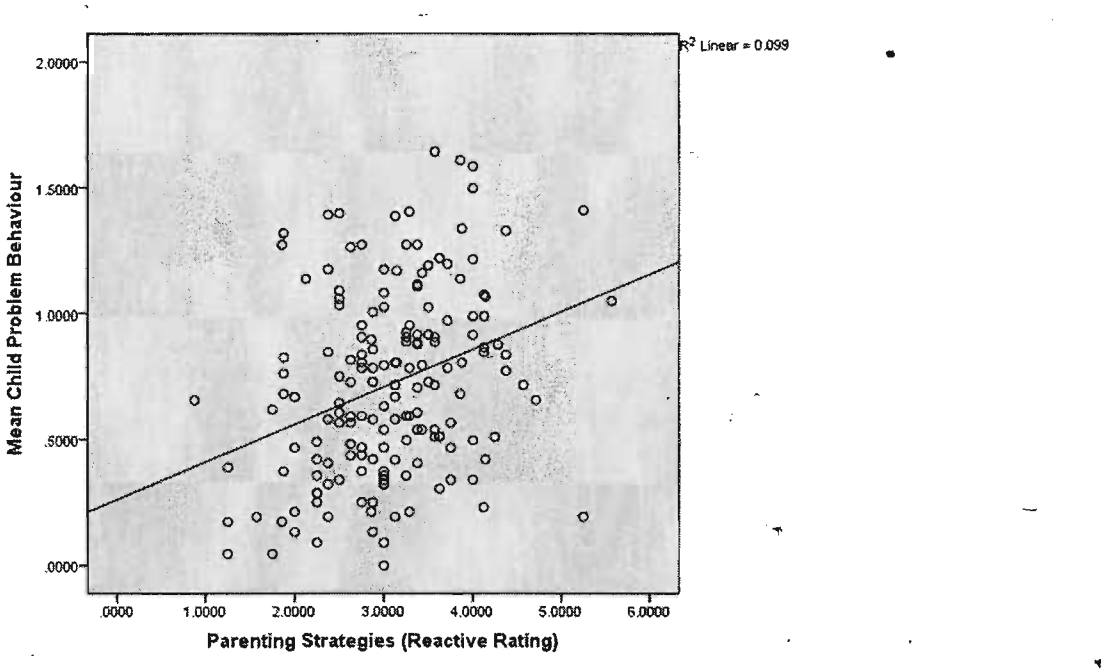

Figure 2. Scatterplot of mean child problem behaviour and parenting strategies use (reactive rating). $R^2 = .099$.

Mediation Effects. Mediation effects (Hypotheses 4 and 5) could not be tested because significant correlations were not found between the three key variables of PSE, parenting strategies use, and child problem behaviour (Baron & Kenny, 1986). A correlation matrix between these variables can be found in Table 11.

Table 11. Correlation Matrix of Key Variables

Variable	1	2	3	4	5	6	7	8	9	10
1. Child Problem Behaviour (number)	-									
2. Child Problem Behaviour (mean rating)	.870**	-								
3. PSE Composite	-.134	-.100	-							
4. PSE General	-.085	-.043	.825**	-						
5. PSE Stopping	-.063	-.024	.735**	.501**	-					
6. PSE Preventing	-.131	-.101	.834**	.631**	.412**	-				
7. PSE Teaching	-.154*	-.146	.821**	.551**	.456**	.626**	-			
8. Proactive Strategies	.156*	.117	.054	-.016	.001	.067	.098	-		
9. Reactive Strategies	.276**	.315**	-.098	-.137	-.008	-.110	-.057	.348**	-	
10. Pro/Reac. Proportion	-.096	-.184*	.135	.112	-.026	.165*	.156*	.625**	-.433**	-

Note. $*p < .05$, $**p < .01$

Moderation Effects. To test whether PSE (composite) had moderating effects on the relationship between ASD, DD, or TD diagnosis and child problem behaviour (Hypothesis 6), a hierarchical multiple regression was used. Each predictor variable was mean-centered to reduce multicolinearity (Aiken & West, 1991). For each diagnostic group, a dummy variable was entered (i.e., diagnosis or no diagnosis) at the first step. PSE (composite) was entered at the next step. Finally, an interaction term of these predictors (i.e., dummy variable multiplied by PSE) was entered to test for any significant interaction between diagnosis and PSE that predicted mean child problem behaviour ratings. Table 12 show results for ASD, DD, and TD groups.

Table 12. Multiple Regression (Diagnosis and PSE)

	Step	IV	*T*	*B*	*SE*	ΔR^2
ASD Group	1	(constant)	27.79	.80	.03	.18
		ASD/no ASD	6.01	.17	.04	
	2	(constant)	28.01	.80	.03	.02
		ASD/no ASD	6.14	.18	.03	
		PSE	-1.79	-.03	.02	
	3	(constant)	27.97	.80	.03	.004
		ASD/no ASD	6.17	.18	.03	
		PSE	-1.99	-.04	.02	
		ASD /no ASD x PSE	-.87	-.02	.02	

DD Group	1	(constant)	24.82	.75	.03	.04
		DD/no DD	2.67	.08	.03	
	2	(constant)	24.63	.75	.03	.003
		DD/no DD	2.46	.08	.03	
		PSE	-.77	-.02	.02	
	3	(constant)	.00	.77	.03	.04*
		DD/no DD	.01	.09	.03	
		PSE	.96	.001	.02	
		DD/no DD x PSE	.01	.05	.02	
TD Group	1	(constant)	29.10	.69	.02	.32
		TD/no TD	-9.00	-.21	.02	
	2	(constant)	29.02	.69	.02	.00
		TD/no TD	-8.84	-.21	.02	
		PSE	-.28	-.01	.02	
	3	(constant)	28.94	.69	.02	.01
		TD/no TD	-8.75	-.21	.02	
		PSE	-.69	-.01	.02	
		TD /no TD x PSE	-1.37	-.02	.02	

Note. DV = mean child problem behaviour ratings. * $p = .01$.

No significant interaction effect was found for both TD and ASD diagnosis and PSE as a predictor of child problem behaviour. A significant interaction effect was found between DD diagnosis and PSE as a predictor of child problem behaviour, $R^2 = .08$,

$F(3,167) = 4.93, p = .01$. As per Aiken and West's (1991) recommendations, scatterplots showing this relationship can be found in Figure 3. The graphs show a weaker relationship between DD diagnosis and child problem behaviour when PSE is low, and a stronger relationship between DD diagnosis and child problem behaviour when PSE is high.

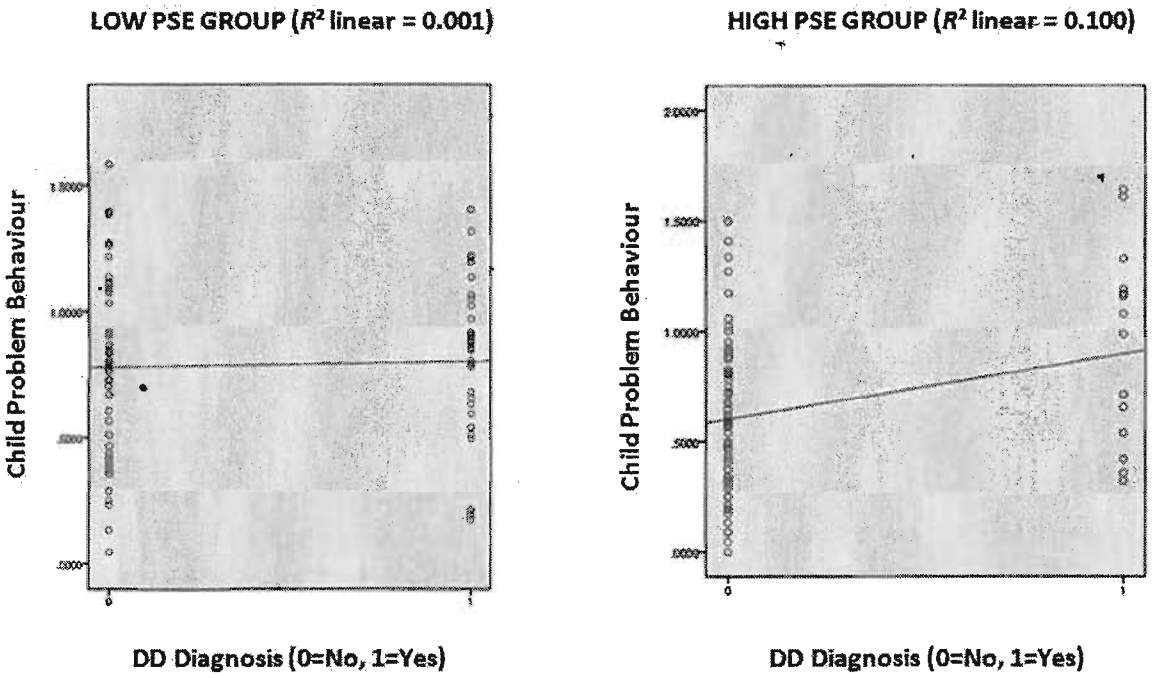

Figure 3. Scatterplots depicting the relationship between DD diagnosis and child problem behaviour for high and low PSE groups.

A similar procedure was used to test whether parenting strategies use (i.e., proactive-reactive proportion) had moderating effects on the relationship between ASD, DD, or TD diagnosis and child problem behaviour (Hypothesis 7). Results can be found in Table 13.

Table 13. Multiple Regression (Diagnosis and Parenting Strategies)

	Step	IV	*T*	*B*	*SE*	ΔR^2
ASD Group	1	(constant)	27.79	.80	.03	.18
		ASD/no ASD	6.01	.17	.03	
	2	(constant)	29.08	.80	.03	.07
		ASD/no ASD	6.78	.19	.03	
		PS	-3.81	-1.28	.34	
	3	(constant)	28.47	.81	.03	.004
		ASD/no ASD	6.84	.20	.03	
		PS	-3.72	-1.49	.40	
		ASD /no ASD x PS	-.98	-.39	.40	
DD Group	1	(constant)	24.82	.75	.03	.04
		DD/no DD	2.69	.08	.03	
	2	(constant)	24.98	.75	.03	.03
		DD/no DD	2.46	.07	.03	
		PS	-2.19	-.81	.37	
	3	(constant)	24.55	.75	.03	.008
		DD/no DD	2.31	.07	.03	
		PS	-2.51	-1.07	.42	
		DD/no DD x PS	-1.23	-.52	.42	

TD Group	1	(constant)	29.10	.69	.02	.32
		TD/no TD	-9.00	-.21	.02	
	2	(constant)	29.99	.69	.02	.05
		TD/no TD	-9.44	-.22	.02	
		PS	-3.44	-1.04	.30	
	3	(constant)	30.06	.69	.02	.01
		TD/no TD	-9.44	-.22	.02	
		PS	-3.45	-1.04	.30	
		TD /no TD x PS	1.22	.37	.30	

Note. DV = mean child problem behaviour ratings.

For all three diagnostic groups, no significant interactions were found between diagnosis and parenting strategies use as a predictor of child problem behaviour.

Discussion

Between Group Hypotheses

Hypothesis 1. Parents of children with ASD will report more child behaviour problems, use more reactive strategies, fewer proactive strategies, and have lower parenting self-efficacy than parents of children with DD and parents of TD children.

Child Problem Behaviour. Results indicated that parents of children with ASD reported a greater number of child problem behaviours and had higher mean ratings of child problem behaviours than the TD group, partially supporting Hypothesis 1. Little research exists on comparing child problem behaviours between children with and without autism. Previous research has demonstrated that children with ASD are at a heightened risk for a variety behaviour problems, such as self-injury, stereotyped behaviour, aggression, destructive behaviour, and feeding problems (Rojahn et al., 2001; Schreck et al., 2004). The present findings contribute to this literature base in identifying the different challenges that are faced by families who have children with and without ASD. According to the present findings, parents who have children with ASD may be more likely to experience a greater frequency and intensity of child problem behaviours, compared to those who have children with TD. This suggests that the difficulties in socialization, communication, and repetitive and stereotyped behaviours that culminate in an ASD diagnosis may often translate to a variety of child problem behaviours that are considered highly challenging to parents.

Parenting Self-Efficacy. With respect to PSE, Hypothesis 1 was not supported, in that parents of children with ASD did not report lower PSE scores than both DD and TD groups. Actually, parents in the ASD group were found to report higher PSE ratings

on preventing child problem behaviour than those in the DD group. It may be that services for Canadian families who have children with autism have become more accessible over the last decade, especially for families residing in Ontario (Ministry of Children and Youth Services, 2012). Public awareness of ASD has improved and advocacy in the autism community is strong, which could partly explain parents' feelings of self-efficacy. Another speculation is that many of those in the current DD sample had comorbid organic conditions (e.g., spina bifida, Down Syndrome, brain damage), which parents may have attributed as being the cause of child problem behaviours, and thus, felt less controllability over. While this study did not explore these possibilities, future research in this area could help inform intervention planning for families who have children with ASD and DD. More comparison studies need to be conducted to further examine differences in PSE across ASD and DD groups.

Parenting Strategies. Parents in the ASD group did not use more reactive strategies and fewer proactive strategies than those in the DD and TD groups as hypothesized. In fact, parents in the ASD group reported using more proactive strategies than the TD group. This may reflect the accessibility and amount of services that have improved for families of children with ASD in recent years. In particular, positive behaviour supports emphasizing the use of reinforcement and preventative approaches (i.e., antecedent strategies) have been established as evidence-based (Feldman et al., 2002) and considered to be best practice in the provision of services to individuals with ASD (Perry & Condillac, 2003). Therefore, parents in the ASD group may be using more proactive strategies than those in the TD group as a result of access to services that emphasize the use of these approaches.

Parents in the ASD group reported using fewer reactive strategies than those in the DD group. Because it was found in this study that parents of children with ASD reported higher PSE in preventing child problem behaviour than those in the DD group, it may be that parents in the ASD group are also more likely to use proactive strategies rather than reactive strategies than those in the DD group. Indeed, when measured by using a proportion of proactive to reactive parenting strategies use, parents of children with ASD appear to be more proactive than reactive compared to the DD and TD groups. It can be speculated that families of children with ASD have more access to parent training services that emphasize the use of proactive strategies over reactive ones, compared to families of children with DD. Future research is needed to explore this potential difference.

Hypothesis 2. Parents of children with DD will report more child behaviour problems, use more reactive strategies, fewer proactive strategies, and have lower parenting self-efficacy than parents of TD children.

Child Problem Behaviour. Supporting Hypothesis 2, parents of children with DD reported significantly more child problem behaviours and higher mean ratings of child problem behaviour than the TD group. This is consistent with findings from previous research (Baker et al., 2002; Feldman et al., 2000; Merrell & Holland, 1997; Paczkowski & Baker, 2007; Richman, Stevenson, & Graham, 1982). Given the range of difficulties associated with a DD diagnosis, this finding is not surprising. However, this result provides additional evidence that families who have children with DD require accessible community services and supports that are tailored to address their unique needs.

Parenting Self-Efficacy. Between subject effects of PSE composite scores were found to be significant, but following Bonferroni-corrected pairwise comparisons, the difference between DD and TD groups was no longer significant. It is worth mentioning that the DD group reporting lower PSE composite scores than the TD group approached significance ($p = .059$). This finding suggests that parents who have children with DD may feel less self-efficacious about their overall management of child problem behaviour, compared to parents who have children with TD. It may be particularly important to provide parent support to families who have children with DD to increase parents' feelings of competence in managing child problem behaviour. Future research should further explore whether lower overall PSE is in fact a barrier that families who have children with DD experience.

Parenting Strategies. Parents in the DD group reported using more reactive strategies than those in the TD group. This is consistent with previous research findings that have suggested that parents of children with DD are more likely to use reactive strategies when child problem behaviours are high (Tucker & Fox, 1995). Interestingly, parents of children with DD also reported using more proactive strategies than those in the TD group. These data suggest that parents who have children with DD may be using a number of different strategies in an attempt to identify those that are effective in managing heightened levels of child problem behaviour. Further research is needed to identify why parents of children with DD are using more different proactive and reactive strategies compared to those who have children with TD.

Relationships Between Key Variables

Hypothesis 3. Parenting strategies and parenting self-efficacy will be significant predictors of child problem behaviour.

Parenting strategies, as measured by a proportion of proactive to reactive strategies, predicted 3% of the variance in child problem behaviour. More specifically, higher proportions of proactive to reactive parenting strategies use predicted lower mean ratings of child problem behaviour. This supports previous findings that an emphasis on pre-emptive strategies relative to reactive approaches (e.g., authoritative parenting) may be associated with fewer child problem behaviours (Baumrind, 1971, 1991). It appears that a combination of parenting strategies, with more proactive than reactive strategies being used, may be related to fewer child problem behaviours.

Reactive parenting strategies predicted 10% of the variance in mean ratings of child problem behaviour. Consistent with previous research findings (Clunies-Ross, Little, & Kienhuis, 2008; Gardner et al., 1999; Stormont, 2001; Tucker & Fox, 1995), higher reactive parenting strategies use predicted higher child problem behaviour ratings.

Theoretically, this supports the notion that parenting strategies (i.e., behaviours) may have greater predictive power than PSE (i.e., cognitions) in explaining child problem behaviour. Further investigation is required to determine whether one is in fact a collateral effect of the other. Clinically, the findings highlight the need to discourage parents from using predominantly consequence and punishment based strategies, as the data suggest that using reactive parenting strategies appears to be associated with more child problem behaviours. If in fact, future research reveals that this relationship represents an underlying causality, then parents should be encouraged to use a greater

proportion of proactive to reactive approaches. Supporting this idea, a substantial body of literature has demonstrated positive outcomes of behavioural parent training programs that emphasize the use of proactive strategies, across ASD, DD, and TD populations (Feldman et al., 2002; Patterson et al., 2005; Sanders, 1999; Webster-Stratton et al., 1989).

Hypothesis 4. The relationship between parenting strategies and child problem behaviour will be mediated by parenting self-efficacy (i.e., cognitive interpretation of parenting).

Hypothesis 5. The relationship between parenting self-efficacy and child problem behaviour will be mediated by parenting strategies (i.e., behavioural interpretation of parenting).

Mediation effects of parenting strategies and PSE (Hypotheses 4 and 5) could not be tested, due to a lack of correlation found between the key variables using our sample. Future research could examine differential relationships between the key variables within each of the diagnostic groups, using larger sample sizes or SEM methods.

Hypothesis 6. The relationship between ASD, DD, or TD diagnosis and child problem behaviour will be moderated by parenting self-efficacy (i.e., cognitive interpretation of parenting).

PSE was found to interact with DD diagnosis in predicting 8% of child problem behaviour. When PSE is low, the positive relationship between DD diagnosis and child problem behaviour is weak. When PSE is high, the relationship between DD diagnosis and child problem behaviour is stronger. In other words, higher PSE predicted higher child problem behaviour ratings, for parents of children with DD. This effect was not in

the direction that was hypothesized. The reasons for this finding remain unclear. Some research has indicated that parents of children with developmental disabilities experience considerable joy and hope in raising their children (Kearney & Griffin, 2001). Perhaps parents' feelings of self-efficacy in managing child problem behaviour are weakly related to child problem behaviour, if at all. After all, none of the PSE measures in this study predicted child problem behaviour in the overall sample. Further, with the exception of the relationship between PSE in teaching and number of child problem behaviours, none of the PSE measures were found to be correlated with child problem behaviour for the overall sample. This speculation is made with reservations, and these findings are to be interpreted with caution. More research is necessary to replicate this finding and to further explore the nature of this interaction for families of children with DD.

Strengths and Limitations

To date, the relationships between child problem behaviour, PSE, and parenting strategies for families with children who have ASD, DD, and TD have not yet been examined in conjunction. This study provided evidence for differences in these three key variables across ASD, DD, and TD populations. As well, this study was guided by the theoretical implications of its findings, which is generally not common in research on parenting, PSE, and child problem behaviour (Sevigny & Loutzenhiser, 2009). Results provided data that can inform clinical decision making for families who have children with ASD and DD, as well as for the broader general population. Altogether, the data from this study make a valuable contribution to the parenting literature.

Nevertheless, some methodological limitations are noted here. One limitation of our sample was the heterogeneous nature of each group (Tables 3 and 4). However, it is

argued that ASD and DD are heterogeneous by definition. ASD is characterized as a spectrum disorder, and developmental delay is caused by multiple environmental and organic conditions. Further research is needed to compare the unique needs and challenges of each group, as the current evidence base in this area is scarce.

Families of children with ASD and DD reported higher child problem behaviour mean ratings, but these group differences co-varied with family income (i.e., parents of children with DD had lower family income than those of children with TD) and marital status (i.e., parents of children with TD are more likely to be married or living together compared to parents of children with ASD and DD). Thus, some group differences may be partly explained by differences in family income and parents' marital status. Previous research has suggested that families who have children with DD are more likely to have lower family income (Brown & Schormans, 2003; Lopez, Clifford, Minnes, & Ouellete-Kuntz, 2008) and divorced parents (Raynor & Rudolf, 2006). Some researchers have found that higher divorce rates occur for parents of children with ASD (Hartley et al., 2010), while others have not (Freedman, Kalb, Zablotsky, & Stuart, 2011). Because previous research have supported at least some of these demographic differences between ASD, DD, and TD groups, it can be speculated that any study with a representative sample of these groups would share these limitations.

Group differences in the use of proactive strategies (i.e., ASD and DD groups were more proactive than the TD group) were found to co-vary with the location of the home (i.e., rural or urban) and whether the child was born premature. Children in the DD group were more likely to be born premature than the ASD and TD groups, and children in the TD group were more likely to live in rural locations compared to the ASD and DD

groups. While it is not surprising that children in the DD group were more likely to be born premature (Marlow, Wolke, Bracewell, & Samara, 2005), it is unclear why families of children with TD were more likely to live in rural homes. While there is no data to support this speculation, it may be that families of children with ASD and DD are more likely to move to urban locations to access appropriate supports and services.

The selection of participants in the DD group was biased towards those with a greater amount of data from an archival database (i.e., those who had completed all the relevant sections of the CBMS that were the focus of this study). This was done so that the need to substitute missing values was minimal.

Finally, the data available on parenting and child behaviours (i.e., parenting strategies, child problem behaviour) were limited to verbal report of the parents. These data were not verified by direct observation to obtain reliability across what was reported and how the parents and children actually behaved. Future research investigating the level of correspondence between parent report and actual parenting strategies use and child problem behaviour would complement the current findings.

Conclusion

Thus far, there has been little research that has examined the relationships between child problem behaviour, PSE, and parenting strategies specific to families with children who have ASD, DD, and TD. Results of this study provided evidence for differences in child problem behaviour, PSE, and parenting strategies across these three populations. Families with children who have ASD and DD were found to report more child problem behaviours and used more proactive parenting strategies than those with children who have TD. Parents in the DD group used more reactive parenting strategies than those in the TD group. These findings emphasize the need for parent supports and services that are aimed to address child problem behaviour for ASD and DD populations. For the overall sample, a higher proportion of proactive to reactive parenting strategies use predicted lower child problem behaviour mean ratings. As well, the more reactive strategies that parents used, the more likely higher child problem behaviour ratings were reported. The relationships between these key variables provide evidence for a behavioural interpretation of parenting, in that parenting behaviour appeared to be a better predictor of child problem behaviour than PSE was. While PSE was found to moderate the relationship between DD diagnosis and child problem behaviour, this finding did not support a cognitive interpretation of parenting. However, more research is needed to determine which theoretical model – behavioural or cognitive – provides a better explanation of the relationships between child behaviour problems, parenting self-efficacy, and parenting strategies.

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Appendix A: Family Information Questionnaire

CONTACT INFORMATION:

1. Informant's Name: _____

   Informant's Mailing Address: _____

   Informant's Phone Number: _____

   Informant's Email: _____

2. Informant's Relationship to the child: _____

3. Date (month-day-year): _____

4. Child's Initials (first, middle, and last name): _____

5. Child's date-of birth (month-day-year): _____

SECONDARY CONTACT INFORMATION:

People who likely would have forwarding information if you moved:

6. Name: _____

   Phone Number: _____

7. Name: _____

   Phone Number: _____

PARENT/FAMILY INFORMATION

8. Number of all children and adolescents (up to age 18 yrs) living in the home: _____

9. Number of all adults (19 yrs and over) living in the home: _____

10. Location of home (nearest city or town): _____

11. Type of dwelling (Circle ONE):

Apartment *Townhouse* *Boarding home* *Semi-detached* *Detached* *Shelter*

12. Do you (Circle ONE)

*Own Rent Neither (specify):*_____

13. Present marital status of parents (Circle ONE)

Married Living together Separated Divorced Widowed

14. Total family income before taxes (Circle ONE)

less than $5,000 $5,000-9,999 $10,000-14,999 $15,000-19,999 $20,000-24,999

$25,000-29,999 $30,000-34,999 $35,000-39,999 $40,000-44,999 $45,000-49,999

$50,000-54,999 $55,000-59,999 $60,000-64,999 $65,000-69,999 $70,000-74,999

$75,000-79,999 $80,000-84,999 $85,000-89,999 $90,000-94,999 more than $95,000

INFORMATION ABOUT MOTHER

15. Mother's date-of-birth (month-day-year): _____

16. How many years did mother spend in school (including post-secondary):

_____

17. Diploma/degree obtained by mother (Circle all that apply):

None Trade Diploma College University Graduate/Professional

18. Mother had special education experience when in school. (Circle ONE)

No Yes (specify): _____

19. Current occupation of mother: _____

20. Mother works (Circle ONE)

Full-time Part-time No

21. Mother's current prescription medications for mental or physical illness:

22. Mother's physical or sensory limitations: _____

INFORMATION ABOUT FATHER

23. Father's date-of-birth (month-day-year): _____

24. How many years did father spend in school (including post-secondary):

_____

25. Diploma/degree obtained by father (Circle all that apply):

None *Trade Diploma* *College University* *Graduate/Professional*

26. Father had special education experience when in school. (Circle ONE)

No *Yes (specify):* _____

27. Current occupation of father: _____

28. Father works (Circle ONE)

Full-time *Part-time* *No*

29. Father's current prescription medications for mental or physical illness:

30. Father's physical or sensory limitations:

CHILD INFORMATION

31. Child's date-of-birth (month-day-year): _____

32. Child sex (Circle ONE) *Male* *Female*

33. Child' relationship to the family (Circle ONE)

natural child *foster child* *adopted child* *other (specify):* _____

34. Child's birth order (Specify number): _____

35. Child's siblings (Specify numbers of each category; put 0 if none)

younger brothers: _____ older brothers: _____
younger sisters: _____ older sisters: _____

36. Is the child a twin? (Circle ONE)

No *Yes, fraternal* *Yes, identical* *Triplet* *Quadruplet*

37. In general, how is your child's health?

Excellent *Very good* *Good* *Fair* *Poor* *Don't know*

38. Over the past few months, how often has your child been in good health?

Almost all the time *Often* *About half of the time*

Sometimes *Almost never* *Don't know*

39. Child age when a developmental problem was first noticed (if none, write *none*):
_____

40. Child age when a behavioural problem was first noticed (if none, write *none*):
_____

41. Child age at first formal diagnosis of disability (if none, write *none*): _____

42. Child's diagnosis (as told to you by a professional; ✓ all that apply):

____ Learning Disability
____ Global Developmental Delay (cause unknown)
____Intellectual Disability (used to be called mental retardation), cause unknown
____ Down syndrome
____ Fragile X
____ Cerebral Palsy
____ Prader-Willi syndrome
____ Spina Bifida
____ Rett syndrome
____ Epilepsy
____ Lesch-Nyan syndrome
____ Brain damage
____ Williams syndrome
____ Fetal Alcohol syndrome
____ADHD (Attention-Deficit-Hyperactive Disorder)
____ADD (Attention-Deficit-Disorder-no-Hyperactivity)
Autism Spectrum Disorders (ASDs) (check one only)
___Autistic Disorder
___Pervasive Developmental Disorder (Not Otherwise Specified)
___Asperger syndrome
___High Functioning Autism
___Autism or ASD (if not one of the above)
____ other organic/genetic condition (please specify): -
_____
____ other condition (please specify): _____
____ child has no formal diagnosis at this time

If you checked more than one condition, please indicate *primary* diagnosis
_____

43. Child's current level of developmental delay (as told to you by a professional; circle ONE):

No delay *Borderline* *Mild* *Moderate*

Severe *Profound* *Not applicable*

44. Child's other problems (✓ all that apply):

____ hearing problem (please specify): _____
____ vision problem (please specify): _____
____ movement problem (please specify): _____
____ seizures (please specify how many grand mals per month):_____
____ chronic ear infections (Are tubes inserted into ears?) *Yes* *No*
____ headaches
____ eating disorder (please specify): _____
____ chronic constipation
____ chronic diarrhea
____ asthma
____ allergies (please specify): _____
____ recurrent skin rash
____ problem with a major organ (please specify): -
_____
____ frequent colds and flus
____ attention deficit
____ hyperactivity
____ other medical/health problems (please specify): -
_____

45. In the last year, how many different times was the child hospitalized? (stayed over at least one night): _____

46. In the last year, what was the total number of days the child was in hospital (not counting emergency room or clinic visits)? _____

47. What were the reasons for hospitalizations?

48. In the last year, how many times was the child brought to emergency? _____

49. Medications (Please list all medications child is currently taking and their purpose):

PRENATAL AND BIRTH HISTORY OF CHILD

50. Length of pregnancy: full-term:____ premature? (how many weeks): _____

51. Any medical complications during **pregnancy**? (Circle ONE)

No *Yes(Please specify)*_____

52. Any medical complications during **birth**? (Circle ONE)

No *Yes(Please specify)*_____

53. Length of hospitalization: _____

54. Birth Weight:_____

55. Did mother attend prenatal classes? (Circle ONE)

Yes *No*

56. Did mother breast feed? (Circle ONE)

No *Yes (to what age?)*_____

Appendix B: Child Behaviour Management Survey

CHILD BEHAVIOR MANAGEMENT SURVEY 3.0

Date (month-day-year):_____

Relationship of informant to the child:

Child's Initials (first, middle, and last name):

Child's date-of birth (month-day-year):

Child's sex:_____ Child's diagnosis (if known):

SECTION I.

Rating of Child Problem Behavior

Below is a list of possible child problem behaviors. A description of each behavior is provided on the pages immediately following this chart. For each behavior, indicate whether you think the behavior is currently a problem. Use the 7-point scale to score the severity of the problem. For example, if the behavior is never a problem at all, then give a score of "1"; if the behavior is sometimes a problem, give a score of "4"; if the behavior is always a problem, give a score of "7". If you wish to add some more information (for example, describing the child's specific actions, please do so on the right side of the chart. You can also add more comments on additional sheets of paper.

Ratings
1=never a problem, 2=rarely a problem, 3=occasionally a problem, 4=sometimes a problem
5=usually a problem, 6=frequently a problem, 7=always a problem

Behavior	Rating of problem							Details
physical aggression	1	2	3	4	5	6	7	
anger	1	2	3	4	5	6	7	
threats	1	2	3	4	5	6	7	
self-injury	1	2	3	4	5	6	7	
stereotypy/self-stimulation	1	2	3	4	5	6	7	
screams	1	2	3	4	5	6	7	
cries	1	2	3	4	5	6	7	
mood swings	1	2	3	4	5	6	7	
oppositional/noncompliance	1	2	3	4	5	6	7	

2

temper tantrums	1	2	3	4	5	6	7
property damage	1	2	3	4	5	6	7
throwing objects	1	2	3	4	5	6	7
bangs/slams objects/doors	1	2	3	4	5	6	7
paying attention	1	2	3	4	5	6	7
hyperactive/agitated	1	2	3	4	5	6	7
impulsive	1	2	3	4	5	6	7
manners	1	2	3	4	5	6	7
eating	1	2	3	4	5	6	7
toileting	1	2	3	4	5	6	7
dressing	1	2	3	4	5	6	7
sleeping	1	2	3	4	5	6	7
hygiene	1	2	3	4	5	6	7
playing/leisure	1	2	3	4	5	6	7
transitions	1	2	3	4	5	6	7
stealing	1	2	3	4	5	6	7
hoarding	1	2	3	4	5	6	7
running away	1	2	3	4	5	6	7
attention-seeking	1	2	3	4	5	6	7
obsessive thoughts	1	2	3	4	5	6	7
compulsive behaviors	1	2	3	4	5	6	7
bizarre talk	1	2	3	4	5	6	7

3

self-talk	1	2	3	4	5	6	7
hallucinations	1	2	3	4	5	6	7
withdrawn/isolated	1	2	3	4	5	6	7
fearful/anxious	1	2	3	4	5	6	7
touching others	1	2	3	4	5	6	7
touching self	1	2	3	4	5	6	7
eating nonedibles	1	2	3	4	5	6	7
behavior in public	1	2	3	4	5	6	7
stripping	1	2	3	4	5	6	7
vomiting	1	2	3	4	5	6	7
rumination	1	2	3	4	5	6	7
other (specify):_____	1	2	3	4	5	6	7
other (specify):_____	1	2	3	4	5	6	7
other (specify):_____	1	2	3	4	5	6	7
other (specify):_____	1	2	3	4	5	6	7

Description of Behaviors

Physical Aggression - attempts to (but is prevented or misses) or actually hits, slaps, punches, bites, pinches, scratches, pokes, kicks, shoves or throws objects at another person with sufficient intensity to inflict or potentially inflict immediate pain and/or injury to the victim.

Anger - directs rage, yells, at another person, animal, or object

Threats - verbally or nonverbally (e.g., raises fist) threatens to harm another person; does not have to be angry at the time.

Self-injury - attempts to (but is blocked) or actually hits, slaps, punches, bites, pinches, scratches, pokes, kicks own body or nonaccidently brings body part in contact with hard object with sufficient intensity to cause immediate or accumulated injury.

Stereotypy/self-stimulation - nonfunctional repetitive asocial behavior (e.g., rocking, finger flicking, headweaving, spinning objects, twirling self, constant touching).

Screams - shouts out in a very loud voice.

Cries - emotionally upset with tears in eyes.

Mood swings - unpredictable, quick changes in emotional state from one extreme to the other (e.g., from happy to sad; agitated to calm).

Oppositional/noncompliance - does not follow instructions or rules.

Temper tantrums - stomps feet, falls to floor, thrashes about.

Property damage - purposely attempts to, or actually breaks an object

Throwing objects - tosses, pitches, propels objects that are not supposed to be thrown (e.g., throws food on the floor).

Bangs/slams objects/doors - pushes, kicks, hits an object/door with sufficient force to be make a loud sound and/or cause it to move.

Paying attention - looking at person who is speaking to him/her.

Hyperactive/agitated - constantly in motion.

Impulsive - reacts immediately without thinking.

Manners - acts socially appropriately; is polite; shares; waits turn.

Eating - eats most foods given to him/her; good table manners.

Toileting - eliminates in toilet or potty; does not have accidents during the day or at night.

Dressing - cooperates with dressing routine or dresses self with or without assistance

Sleeping - cooperates with bedtime routine; sleeps in own bed throughout the night; wakes up at a reasonable time in the morning; not difficult to get out of bed in the morning.

Hygiene- cooperates with washing, bathing, and toothbrushing routines; keeps self reasonably clean.

Playing/leisure - uses toys the way in which they were designed; can keep self occupied playing with toys, games, pretend, watching TV or videos, listening to music; plays cooperatively with others.

Transitions - does not get upset when there is a change (e.g., going from one place to another; changing

activities; going away; visitors).

Stealing - takes others' possessions without their permission.

Hoarding - stores a lot of objects; will not let things be thrown out.

Running away - runs in situations which may be dangerous or socially inappropriate (e.g., into the street, in the store); attempts to leave house, daycare, etc.

Attention-seeking - craves attention of others; won't leave your side; pull at you to get your attention; acts silly to get attention.

Obsessive thoughts - dwells on and talks about the same themes over and over again (e.g., the weather, Christmas).

Compulsive behaviors - rituals; doing the same things over and over again (e.g., lining up objects; washing hands excessively; gets very upset if things are not in their place.

Bizarre talk - talks outloud about strange topics.

Self-talk - other than during pretend play, talks, mumbles, or whispers when alone, or to no one in particular.

Hallucinations - other than during pretend play, acts as if something is happening that is not.

Withdrawn/isolated - keeps to him/herself; does not like to be around other people; shy; in own world.

Fearful/anxious - afraid of, runs away from, harmless situations; shivers; expresses fear; panics.

Touching others - inappropriate and/or too frequent touching of others.

Touching self - inappropriate and/or too frequent touching of self.

Eating nonedibles - putting nonnutritive substances in mouth (e.g., grass, twigs, cigarettes, pens).

Behavior in public - embarrassing behavior in public places or in front of others; difficult to control in public places.

Stripping - takes off clothing at inappropriate times.

Vomiting - throws up food but is not sick.

Rumination - brings up already swallowed food into mouth and re-eats it.

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SECTION II.

Parent Child Behavior Management Strategies

Please fill-out this section for a behavior in Section I that is the most problematic (i.e., had the highest score). If more than one behaviour had the same high score, then pick one that occurs most frequently.

In this section, we want you to write out, in your own words, what you usually do to handle your child's problem behavior.

My child's most problematic behavior: _____

How I handle this problem:

_____

_____

_____

_____

_____

_____

Using a scale of 1 to 7:

a. Rate the effectiveness of this approach.

1	2	3	4	5	6	7
not effective		moderately effective				very effective

b. Rate the effectiveness of this approach in stopping the problem behavior when it does occur.

1	2	3	4	5	6	7
not effective		moderately effective				very effective

7

c. Rate the effectiveness of this approach in preventing the problem behavior from occurring again.

1	2	3	4	5	6	7
not effective		moderately effective				very effective

d. Rate the effectiveness of this approach in teaching the child a better way of behaving.

1	2	3	4	5	6	7
not effective		moderately effective				very effective

8

How consistently do you use this approach:

1 2 3 4 5
not very consistent moderately consistent very consistent

How long have you been using this approach?:
Are others, who look after the child, using the same approach?
If yes: spouse:____ other family:____ babysitter:____ daycare/preschool/school:

CBMS Supplemental Checklist on Management Strategies

Please indicate how **frequently** you use the following strategies to manage your child's problem behavior:

	Never			*Sometimes*			*Usually*
1. Physical or Mechanical Restraint (R) (includes such strategies as holding the child down and the use of a harness)	1	2	3	4	5	6	7
2. Nothing/Ignore (R) (not paying attention to behaviour or child)	1	2	3	4	5	6	7
3. Time-Out (R) (includes removing the child from activities for a fixed period of time	1	2	3	4	5	6	7
4. Respouse Cost (R) (taking away privileges)	1	2	3	4	5	6	7
5. Positive Verbal for Appropriate Behavior (P) (includes praise, approval and encouragement)	1	2	3	4	5	6	7
6. Positive Physical and Tangibles for Appropriate Behavior (P) (includes hugging the child or giving the child a reward like a toy, when he/she is behaving appropriately)	1	2	3	4	5	6	7
7. Positive Physical and Tangibles for Inappropriate Behavior (R) (includes trying to soothe or calm the child down or giving the child what he/she wants, when he/she is behaving inappropriately)	1	2	3	4	5	6	7
8. Proactive and Preventative (P) (includes strategies used before the problem behavior	1	2	3	4	5	6	7

occurs to try to prevent it)

9. Negative Verbal (R) (includes reprimands, saying "no" or "stop", or yelling)	1	2	3	4	5	6	7
10. Distraction or Change Location (R) (includes any attempt to distract child from the problem behavior; trying to get the child to do something different or go somewhere else during problem behavior)	1	2	3	4	5	6	7
11. Models or Teaches Appropriate Behavior (P) (includes instruction and attempts to demonstrate more appropriate or desirable behavior; reasoning)	1	2	3	4	5	6	7
12. Corporal Punishment (R) (includes spanking and the strap)	1	2	3	4	5	6	7

SECTION III.

Please put a check mark next to the ones that applies to you

More Information About Child Behavior Management Strategies Used

1. How did you learn about the strategies you described that you use for child problem behavior?:
   a. just doing what I feel will work:
   b. it's how I was brought up:
   c. a friend advised me:
   d. a family member advised me:_____ Relation:
   e. read about them:____ Name of book, magazine:
   f. heard about them on the radio___ Name of radio show:
   g. saw them on TV:____ Name of TV show:
   h. saw them on a video:___ Name of video:
   I. a professional showed me:
   - type of professional
      __ family doctor
      __ pediatrician
      __ neurologist
      __ psychiatrist
      __ other medical doctor (specify speciality):
      __ nurse
      __ chiropractor
      __ dietician/nutritionist
      __ naturopath
      __ homeopath
      __ psychologist
      __ behavior consultant

__ infant worker
__ social worker/case coordinator
__ teacher/ teacher's aid (daycare, preschool, kindergarten, grade school, spec. ed)
__ other professional (specify):

- type of training provided by the professional (check all that apply)

__ came to my home
__ in their office, clinic, or school
__ attended a course, workshop, lecture, etc.
__ gave me instructional materials such as books, manuals, audiotapes, and videos

j. other ways, not listed above, that you learned about the strategies you are using (specify):

---

2. Is what you are doing for child problem behavior part of a formal, written treatment program designed by a professional?

- If yes, do you collect data to evaluate the program?
- Do you and/or a professional regularly review and evaluate the data?
- How often?: _____

3. Is the child receiving any kind of prescription medication specifically for problem behavior?

_____

4. Is the child receiving any kind of nonprescription medication, remedies, special diets, etc., specifically for problem behavior?

If you wish, please provide any additional information about your child, s behavior and parenting strategies that you use:

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Thank you for participating. If you wish, please comment about any aspect of this questionnaire:

Appendix C: Letter of Invitation

Brock

Faculty of Social Science
Centre for Applied Disability Studies

Brock University
Centre for Applied Disability Studies
Niagara Region
500 Glenridge Ave.
St. Catharines, ON
L2S 3A1 Canada
T 905 688 5550 x5395
F 905 378 5719
disabilitystudies@brocku.ca
www.brocku.ca/disabilitystudies

Dear Parent:

If you have a child between the ages of 2 to 7 years old, we invite you to participate in a research project entitled, "Comparison of child problem behaviours, parenting strategies and self-efficacy in families of children with and without developmental delay". The Principal Investigator is Prof. Maurice Feldman, Centre for Applied Disability Studies at Brock University. The co-investigator is Prof. Andrew McNamara, St. Lawrence College, Kingston, ON; Adjunct faculty, Centre for Applied Disability Studies at Brock University. The purpose is to examine differences among parents of children with developmental delay and autism compared with parents of typically developing children on how they handle child problem behaviours and how confident they may feel.

You would be eligible to participate if your child is between 2 and 7 years old and has a developmental delay (for any reason) or has an Autism Spectrum Disorder (Autistic Disorder, PDD-NOS, High Functioning Autism or Asperger syndrome) or is typically developing.

Your involvement is greatly appreciated and will help to further our understanding of the relationship between parenting strategies and child problem behaviours. The questionnaire is expected to take approximately one hour to complete. Questions will ask you about: (a) Child behaviour, (b) parenting strategies that you use to deal with troublesome child behaviours and (c) parental self-confidence, and (d) some descriptive information about the family. You can fill out the questionnaire with a pen and mail it back to us (self-addressed, stamped envelope will be provided. Alternatively, you can complete the questionnaire by email.

Results from this study will be used to enhance our understanding of the relationship between parenting strategies and child problem behaviour, specifically in families of children with developmental delays and autism. A written summary of the findings will be made available to you. The identities of the participants involved in the study will not be disclosed. Any information elicited from participants will be treated with absolute confidentiality, and access to information that might identify participants will be limited to the principal investigator, students and research assistants involved in this project. The names of individual participants in the study will not be mentioned within project reports or presentations generated from this study. Participation in this study is voluntary and individuals may decline answering any question(s) within the questionnaire that they find invasive, offensive, or inappropriate. Participants may withdraw from the study at any stage in the process without penalty. Of course, any individual may decline to participate for any reason without penalty.

If you are interested in participating or have any questions, please contact Olivia Ng <on08rq@brocku.ca>, Principal Investigator Prof. Feldman <mfeldman@brocku.ca> or Co-Investigator Prof. McNamara <amcnamara@brocku.ca>. Following the completion of our study, we would be happy to send you a summary of results. Additionally, questions about your involvement in the study may also be directed to the research ethics officer in the Office of Research Services at 905-688-5550, extension 3035. Thank you for your interest and involvement in this study.

Sincerely yours,

Maurice Feldman, Ph.D., C.Psych. BCBA-D

Appendix D: Informed Consent Form

Brock University, Faculty of Social Sciences
Informed Consent Form-Participants

Principal Investigator: Prof. Maurice Feldman,
Centre for Applied Disability Studies, Brock University
Co-investigator: Prof. Andrew McNamara, St. Lawrence College, Kingston, ON;
Adjunct Faculty, Centre for Applied Disability Studies, Brock University

Title of Study: Comparison of child problem behaviours, parenting strategies and self-efficacy in families of children with and without developmental delay

- I have been given, and I have read the Letter of Introduction provided to me by the principal investigator conducting the study.
- I understand that this study, in which I have agreed to participate, will involve my participation in answering two questionnaires that will require approximately 60 minutes to complete. The purpose of this investigation is to examine differences among parents of children with developmental delays compared with parents of typically developing children on how they handle child problem behaviours and how confident they may feel.
- I understand that my participation will bring only minimal risks or harm, and these risks have been carefully explained to me.
- I understand that my participation in this study is voluntary and that I may withdraw from the study at any time and for any reason without penalty.
- I understand that I may ask questions of the researchers at any point during the research process.
- I understand there is no obligation to answer any question that I do not want to.
- I understand that there will be no payment for my participation.
- I understand that all personal information will be kept strictly confidential, and that all information will be coded to ensure that my name will not be associated with my responses. The questionnaires will be kept in a locked filing cabinet in Prof. Feldman's or Prof. McNamara's locked offices and will only be accessible to them, their students and staff.
- I understand that the results of this study could possibly be distributed in academic journals and conference presentations, and a summary of the results will be made available to the participants in the study upon request. I understand that no identifying information will ever be provided in papers and presentations.

- I understand that Profs. Feldman and McNamara and their future students and research assistants may need to use my data in the future in a manner somewhat different than the original purpose of this study (e.g., to help validate one of the questionnaires). I agree to allow my results to be used in this manner without having to be re-contacted.

- I agree to be contacted in the future about new studies. I understand that if I agree here, I am under no obligation to participate in future studies.

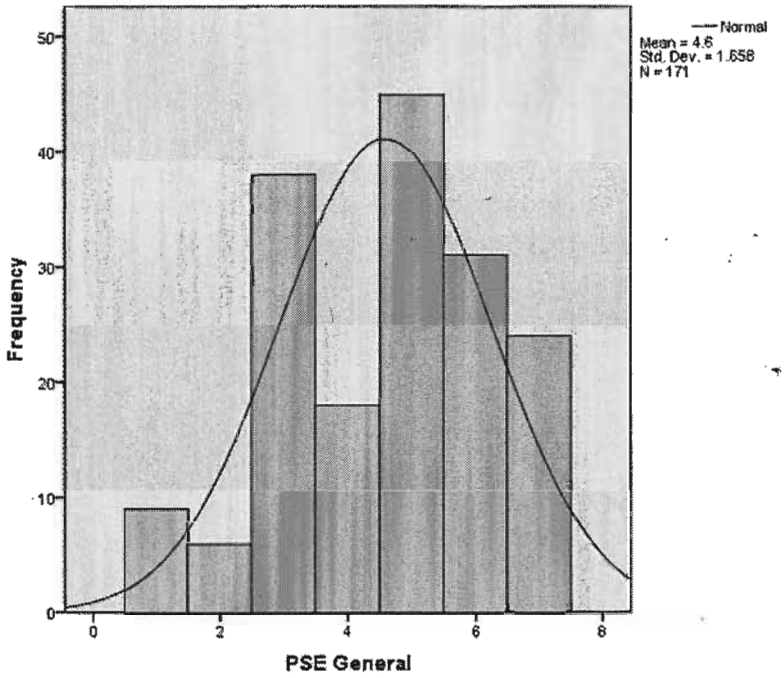
- I understand that submission of the questionnaires constitutes consent to participate in this research study.

This study has been approved by the Brock Research Ethics Board
(File # 03-296)

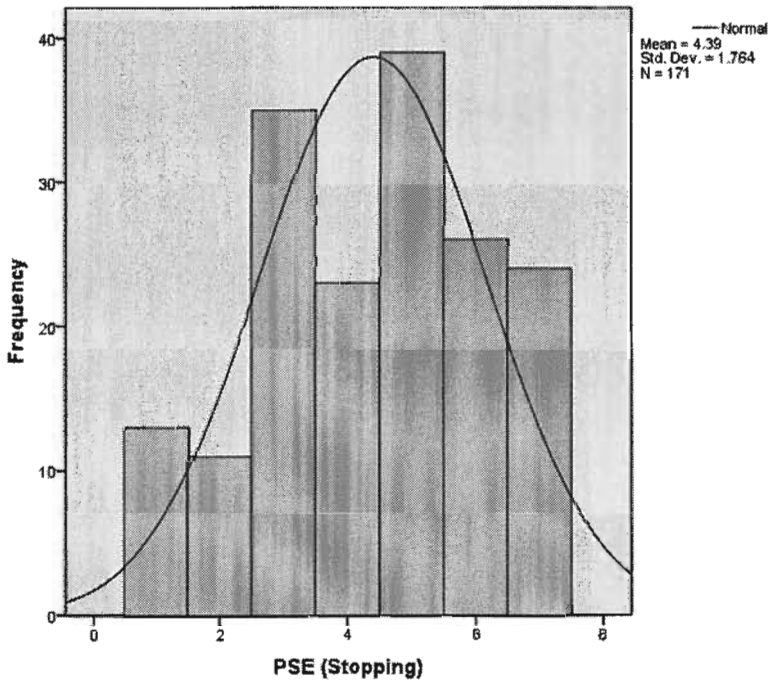
If you have any questions or concerns about your participation in the study, you may contact Prof. Maurice Feldman at (905)688-5550 ext.4894 or by e-mail at mfeldman@.brocku.ca. Concerns about your involvement in the study may also be directed to **Research Ethics Officer**, Lori Walker, in the **Office of Research Services at (905) 688-5550,** extension 3035 or by e-mail at lwalker@.brocku.ca.

Appendix E: Histograms of Key Variables

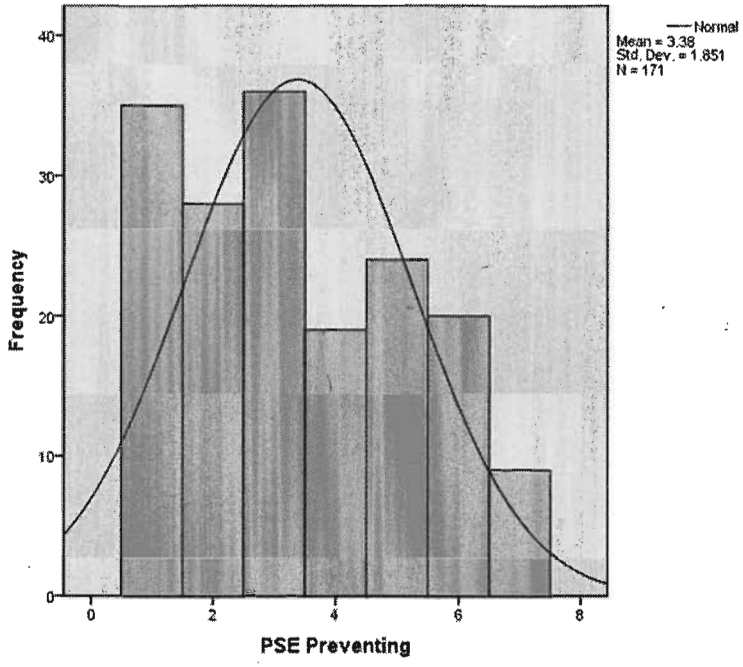
PSE General



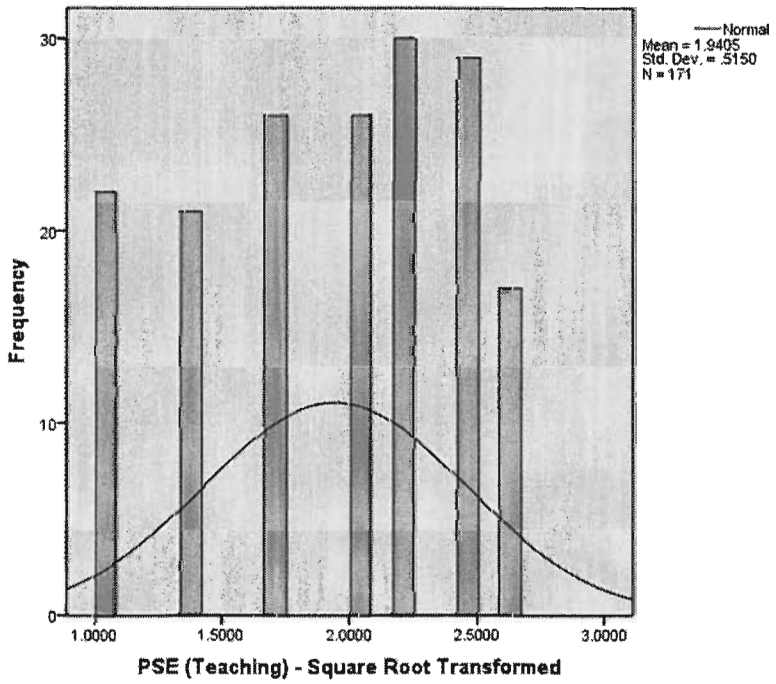
PSE Stopping



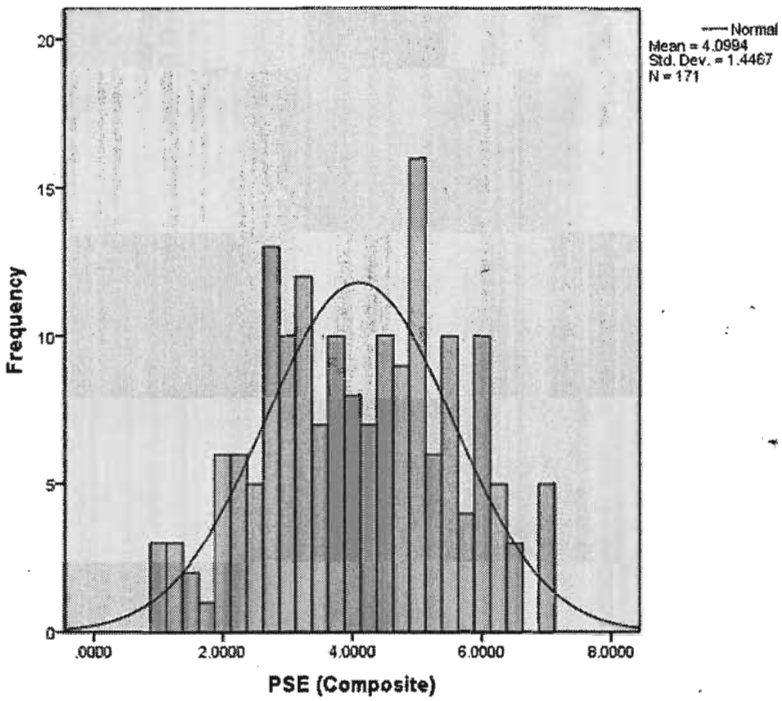
PSE (Preventing)



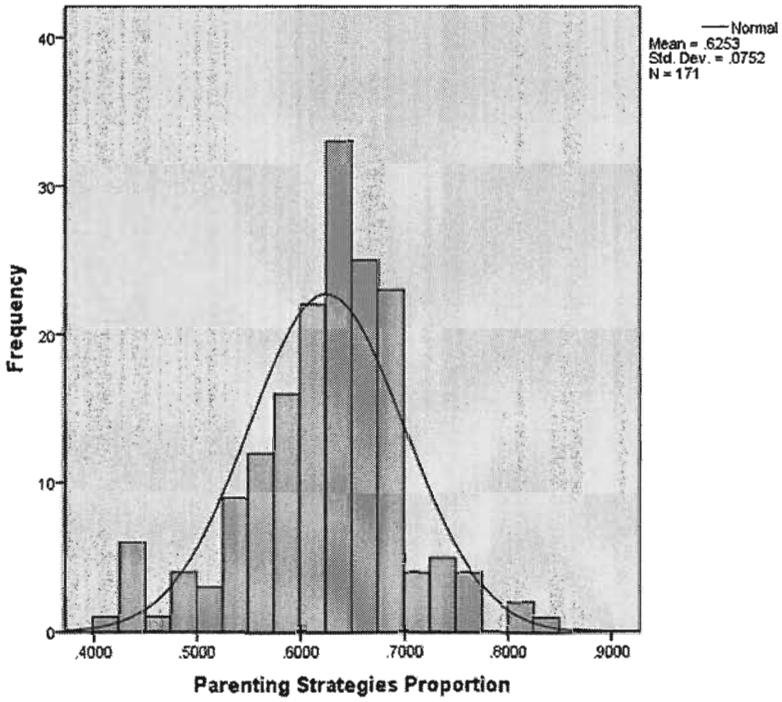
PSE (Teaching) - Square Root Transformed



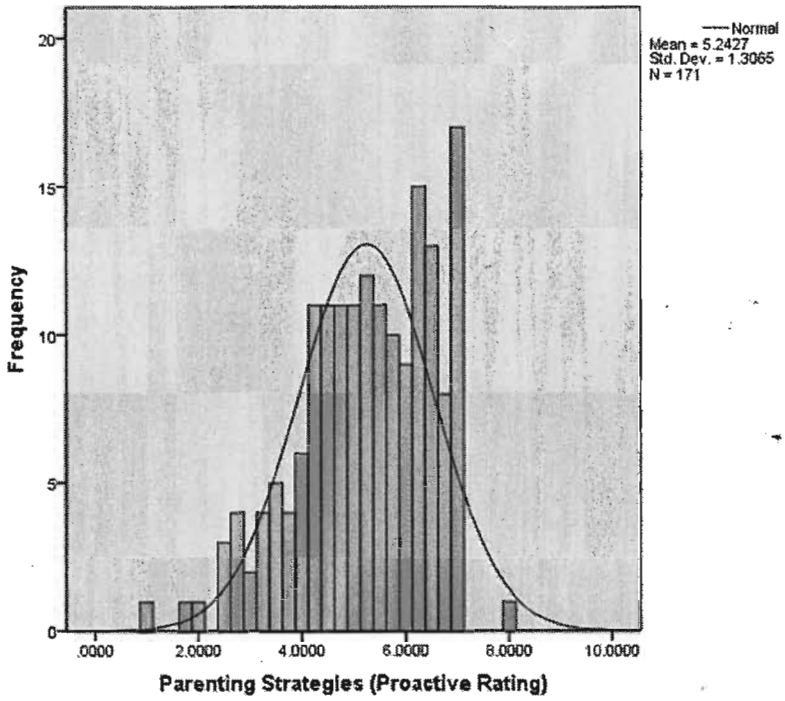
PSE (Composite)



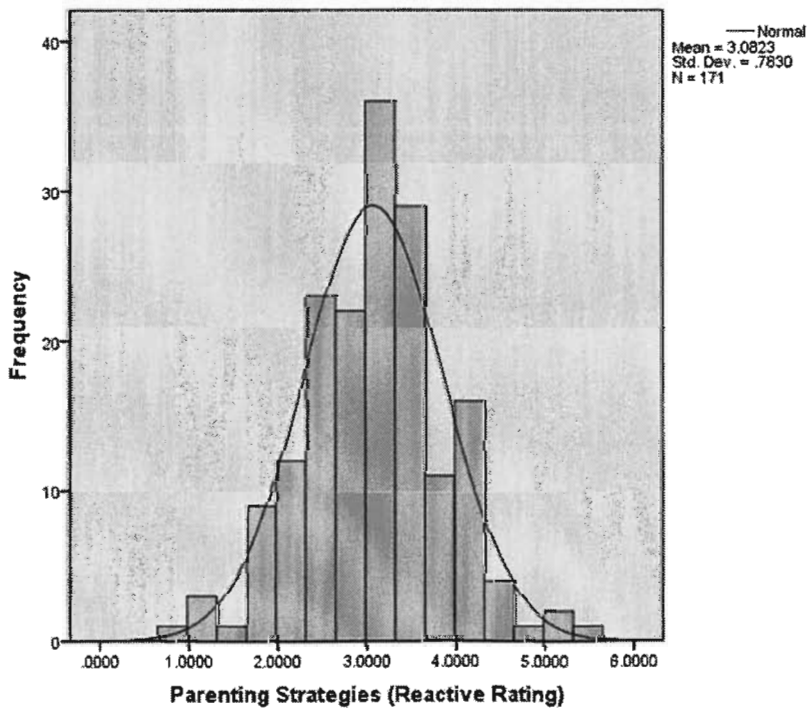
Parenting Strategies Proportion



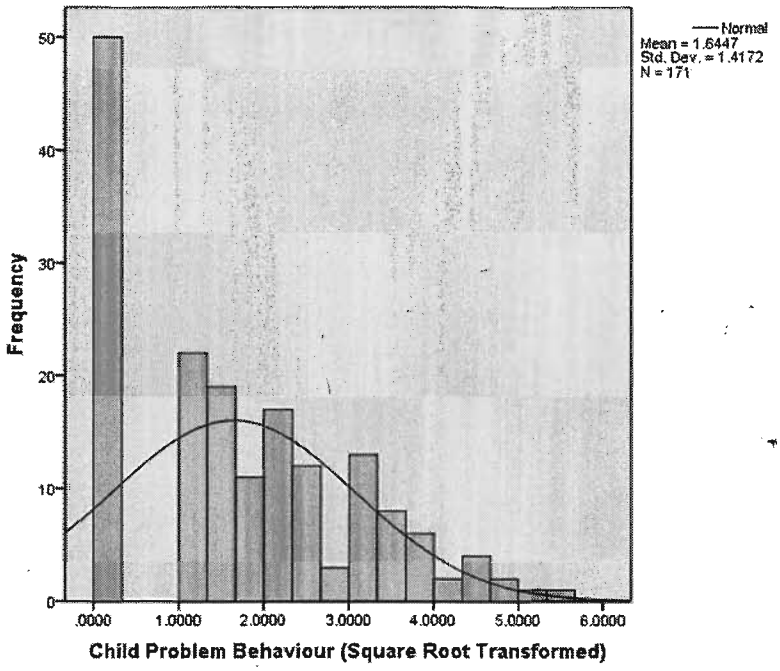
Parenting Strategies (Proactive Rating)



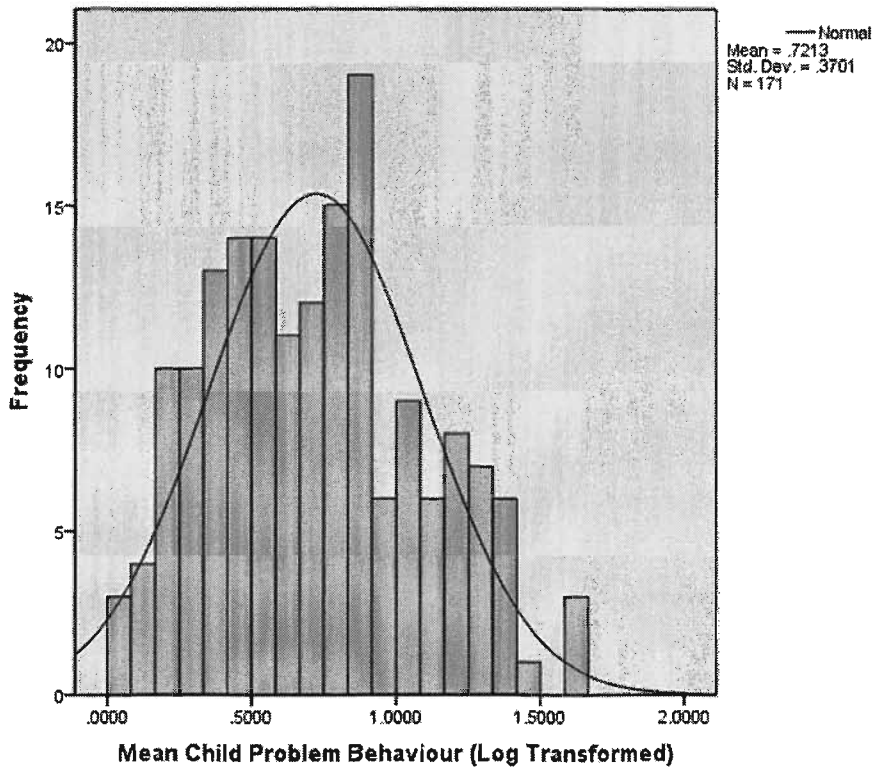
Parenting Strategies (Reactive Rating)



Number of Child Problem Behaviours (Square Root Transformed)



Mean Child Problem Behaviour (Log Transformed)



APPENDIX F: How Demographic Variables were Ruled Out

1. Identify significant group differences using ANOVA and Chi Square tests:

Mother's age, location of home, mother's education, mother's employment status, marital status, family income, child age, premature status, child's level of delay

2. Significant correlations between key variables and demographics:

Child problem behaviour (number) – Correlated with location of home, marital status, family income, child's level of delay

Child problem behaviour (mean) – Correlated with location of home, marital status, family income, child age, child's level of delay

PSE General, Stopping, Teaching – No group differences

PSE Preventing – Correlated with premature status

PSE Composite – Correlated with premature status, child's level of delay

Proactive strategies – Correlated with location of home, premature status, child's level of delay

Reactive strategies – Correlated with premature status

Parenting strategies proportion – Correlated with family income

3. ANCOVA (Variables where group differences were found):

Child problem behaviour (mean) co-varied with marital status and family income

Proactive strategies co-varied with location of home and premature status

4. Demographic group differences (pairwise comparisons):

Marital Status – TD more married/together than ASD and DD

Family Income – DD lower family income than ASD and TD

Location – TD more rural than ASD and DD

Premature – DD more premature than ASD and TD

5. Differences in key variables (pairwise comparisons):

Child problem behaviour (mean) – TD less child problem behaviour than ASD and DD

Proactive strategies – TD less proactive than ASD and DD

ANCOVA (#CPB & location of home)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	51
	3	ASD	48
	4	TD	71

Tests of Between-Subjects Effects

Dependent Variable:sq.#pb

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	131.036[a]	3	43.679	34.914	.000
Intercept	70.597	1	70.597	56.431	.000
fiq.loc	.595	1	.595	.475	.491
Dxcat	118.688	2	59.344	47.436	.000
Error	207.672	166	1.251		
Total	804.000	170			
Corrected Total	338.708	169			

ANCOVA (#CPB & marital status)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	51
	3	ASD	48
	4	TD	72

Tests of Between-Subjects Effects

Dependent Variable:sq.#pb

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	136.804[a]	3	45.601	37.216	.000
Intercept	457.940	1	457.940	373.737	.000
fiq.mar	4.031	1	4.031	3.290	.071
Dxcat	125.629	2	62.814	51.265	.000
Error	204.625	167	1.225		
Total	804.000	171			
Corrected Total	341.429	170			

ANCOVA (#CPB & family income)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	46
	3	ASD	43
	4	TD	65

Tests of Between-Subjects Effects

Dependent Variable:sq.#pb

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	127.596[a]	3	42.532	34.397	.000
Intercept	92.017	1	92.017	74.417	.000
fiq.inc	4.269	1	4.269	3.452	.065
Dxcat	109.888	2	54.944	44.435	.000
Error	185.475	150	1.236		
Total	721.000	154			
Corrected Total	313.071	153			

ANCOVA (#CPB & child's level of delay)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	48
	3	ASD	43
	4	TD	72

Tests of Between-Subjects Effects

Dependent Variable:sq.#pb

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	132.567[a]	3	44.189	35.209	.000
Intercept	146.261	1	146.261	116.537	.000
fiq.del	.589	1	.589	.469	.494
Dxcat	58.519	2	29.259	23.313	.000
Error	199.555	159	1.255		
Total	762.000	163			
Corrected Total	332.122	162			

ANCOVA (CPB mean & location of home)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	51
	3	ASD	48
	4	TD	71

Tests of Between-Subjects Effects

Dependent Variable:log.mpb

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	7.997[a]	3	2.666	28.962	.000
Intercept	13.918	1	13.918	151.226	.000
fiq.loc	.012	1	.012	.131	.718
Dxcat	7.413	2	3.707	40.273	.000
Error	15.278	166	.092		
Total	111.913	170			
Corrected Total	23.274	169			

ANCOVA (CPB mean & marital status)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	51
	3	ASD	48
	4	TD	72

Tests of Between-Subjects Effects

Dependent Variable:log.mpb

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	8.415[a]	3	2.805	31.486	.000
Intercept	82.466	1	82.466	925.715	.000
fiq.mar	**.426**	**1**	**.426**	**4.787**	**.030**
Dxcat	7.452	2	3.726	41.828	.000
Error	14.877	167	.089		
Total	112.262	171			
Corrected Total	23.291	170			

ANCOVA (CPB mean & family income)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	46
	3	ASD	43
	4	TD	65

Tests of Between-Subjects Effects

Dependent Variable:log.mpb

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	7.844[a]	3	2.615	29.368	.000
Intercept	15.417	1	15.417	173.173	.000
fiq.inc	**.510**	**1**	**.510**	**5.723**	**.018**
Dxcat	6.621	2	3.310	37.184	.000
Error	13.354	150	.089		
Total	101.545	154			
Corrected Total	21.198	153			

ANCOVA (CPB mean & child's age)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	51
	3	ASD	48
	4	TD	72

Tests of Between-Subjects Effects

Dependent Variable:log.mpb

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	8.069[a]	3	2.690	29.508	.000
Intercept	8.882	1	8.882	97.440	.000
fiq.cam	.081	1	.081	.889	.347
Dxcat	7.352	2	3.676	40.330	.000
Error	15.222	167	.091		
Total	112.262	171			
Corrected Total	23.291	170			

ANCOVA (CPB mean & child's level of delay)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	48
	3	ASD	43
	4	TD	72

Tests of Between-Subjects Effects

Dependent Variable:log.mpb

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	8.154[a]	3	2.718	30.791	.000
Intercept	26.491	1	26.491	300.099	.000
fiq.del	.069	1	.069	.787	.376
Dxcat	3.752	2	1.876	21.250	.000
Error	14.036	159	.088		
Total	106.469	163			
Corrected Total	22.190	162			

ANCOVA (PSE Preventing & Premature status)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	50
	3	ASD	48
	4	TD	72

Tests of Between-Subjects Effects

Dependent Variable:cbms, worst problem, effectiveness in preventing,

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	35.187[a]	3	11.729	3.571	.015
Intercept	1349.821	1	1349.821	410.995	.000
fiq.pre	6.430	1	6.430	1.958	.164
Dxcat	13.355	2	6.678	2.033	.134
Error	545.190	166	3.284		
Total	2532.000	170			
Corrected Total	580.376	169			

ANCOVA (PSE Composite & Premature status)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	50
	3	ASD	48
	4	TD	72

Tests of Between-Subjects Effects

Dependent Variable:mean PSE (raw) general, stop, prev, teach

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	18.431[a]	3	6.144	3.024	.031
Intercept	1889.625	1	1889.625	930.087	.000
fiq.pre	2.005	1	2.005	.987	.322
Dxcat	9.661	2	4.830	2.378	.096
Error	337.256	166	2.032		
Total	3215.438	170			
Corrected Total	355.687	169			

ANCOVA (PSE Composite & child's level of delay)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	48
	3	ASD	43
	4	TD	72

Tests of Between-Subjects Effects

Dependent Variable:mean PSE (raw) general, stop, prev, teach

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	17.756[a]	3	5.919	2.927	.036
Intercept	888.921	1	888.921	439.573	.000
fiq.del	2.091	1	2.091	1.034	.311
Dxcat	7.441	2	3.721	1.840	.162
Error	321.536	159	2.022		
Total	3120.063	163			
Corrected Total	339.292	162			

ANCOVA (Proactive & location of home)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	51
	3	ASD	48
	4	TD	71

Tests of Between-Subjects Effects

Dependent Variable:cbms suppl. Checklistmean proactive rating,

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	37.605[a]	3	12.535	8.272	.000
Intercept	533.615	1	533.615	352.133	.000
fiq.loc	**15.618**	**1**	**15.618**	**10.306**	**.002**
Dxcat	12.852	2	6.426	4.241	.016
Error	251.553	166	1.515		
Total	4951.188	170			
Corrected Total	289.158	169			

ANCOVA (Proactive & premature status)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	50
	3	ASD	48
	4	TD	72

Tests of Between-Subjects Effects

Dependent Variable:cbms suppl. Checklistmean proactive rating,

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	27.964[a]	3	9.321	5.923	.001
Intercept	2945.001	1	2945.001	1871.462	.000
fiq.pre	**6.376**	**1**	**6.376**	**4.052**	**.046**
Dxcat	19.645	2	9.822	6.242	.002
Error	261.224	166	1.574		
Total	4972.188	170			
Corrected Total	289.187	169			

ANCOVA (Proactive & child's level of delay)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	48
	3	ASD	43
	4	TD	72

Tests of Between-Subjects Effects

Dependent Variable:cbms suppl. Checklistmean proactive rating,

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	21.300[a]	3	7.100	4.447	.005
Intercept	1378.582	1	1378.582	863.459	.000
fiq.del	.001	1	.001	.001	.978
Dxcat	10.961	2	5.480	3.433	.035
Error	253.857	159	1.597		
Total	4744.250	163			
Corrected Total	275.156	162			

ANCOVA (Reactive & premature status)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	50
	3	ASD	48
	4	TD	72

Tests of Between-Subjects Effects

Dependent Variable:cbms suppl. Checklist mean reactive rating,

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	13.380[a]	3	4.460	8.282	.000
Intercept	1019.011	1	1019.011	1892.364	.000
fiq.pre	1.813	1	1.813	3.368	.068
Dxcat	6.513	2	3.257	6.048	.003
Error	89.389	166	.538		
Total	1725.305	170			
Corrected Total	102.768	169			

ANCOVA (Proportion & family income)

Between-Subjects Factors

		Value Label	N
diagnostic category	1	DD	46
	3	ASD	43
	4	TD	65

Tests of Between-Subjects Effects

Dependent Variable:mean proactive / (mean proactive + mean reactive)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.028[a]	3	.009	1.718	.166
Intercept	6.583	1	6.583	1213.077	.000
fiq.inc	.014	1	.014	2.631	.107
Dxcat	.012	2	.006	1.092	.338
Error	.814	150	.005		
Total	61.018	154			
Corrected Total	.842	153			